APPENDIX D

DATA QUALITY REVIEW REPORT

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Data Quality Review Report

SITE INVESTIGATION
FORMER NORTH PACIFIC DIVISION LABORATORY
TROUTDALE, OREGON

Prepared for:
U.S. ARMY CORPS OF ENGINEERS
Seattle District

Prepared by:
URS CORPORATION

February 2002

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Tables

As	arsenic
BFB	bromofluorobenzene
Ca	calcium
CCAL	continuing calibration
CCB	continuing calibration blank
CCC	calibration check compounds
Co	cobalt
Cu	copper
COC	chain-of-custody
Cr	chromium
%D	% difference
DFTPP	decafluorotriphenylphosphine
EPA	U.S. Environmental Protection Agency
Fe	iron
GC/MS	gas chromatograph/mass spectrometry
Hg	mercury
ICAL	initial calibration
ICP	inductively coupled plasma
ICB	initial calibration blank
ICV	initial calibration verification
IS	internal standard
LCS/LCSD	laboratory control spike/laboratory control spike duplicate
Mg	magnesium
MRL	method reporting limit
MS/MSD	matrix spike/matrix spike duplicate
Na	sodium
Pb	lead
PCBs	polychlorinated biphenyls
Pest	organochlorine pesticides
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
%R	% Recovery
RFs	response factors
RPD	relative percent difference
RRFs	average relative response factors
RRT	relative retention times
%RSDs	% relative standard deviations
RT	retention time
SDG	Sample Delivery Group
Sb	antimony
Sr	strontium
SVOCs	semivolatile organic compounds
SwRI	Southwest Research Institute
TCL	target compound list
TPH-Dx	Total Petroleum Hydrocarbons – Diesel range organics
TB	trip blank

VOCs	volatile organic compounds
VOA	volatile organic analysis
µg/L	micrograms per liter

This Data Quality Review Report addresses samples collected as part of a Site Investigation at the former North Pacific Division Laboratory located in Troutdale, Oregon.

A total of 78 primary samples, 12 field duplicates, 6 equipment rinsate blanks, and 11 trip blanks was collected in September 2001. Sound Analytical Services, Inc., of Tacoma, Washington (currently known as Severn Trent Laboratories, Inc., Seattle) conducted all of the analyses with the exception of the chemical agent breakdown product analysis, which was conducted by Southwest Research Institute (SwRI) of San Antonio, Texas. The analytical results are presented in the Site Investigation Report. A summary of data qualification on a per fraction basis is presented in Tables 1 through 8.

The following analyses were conducted.

PARAMETER	METHOD
Target Compound List (TCL) Volatile Organic Compounds (VOCs)	EPA Method 8260B Modified
TCL Semivolatile Organic Compounds (SVOCs)	EPA Method 8270C
TCL Organochlorine Pesticides (Pest)	EPA Method 8081A
TCL Polychlorinated Biphenyls (PCBs)	EPA Method 8082
Total Petroleum Hydrocarbons - Diesel Range and Heavy Oil Organics (TPH-Dx)	NWTPH-Dx Modified
Metals (Total and Dissolved) Ca, Fe, Mg, K, Na	EPA Method 6010B
Metals (Total and Dissolved) As, Al, Sb, Ba, Bc, Cd, Cr, Co, Cu, Pb, Mn, Ni, Sc, Ag, Sr, Tl, V, Zu, U	EPA Method 6020
Mercury (Total and Dissolved) Ca, Fe, Mg, K, Na	EPA Method 7470A/7471A
Explosives (Nitramine & Nitroaromatic Compounds)	EPA Method 8330
Total Cyanide	EPA Method 9012A
Reactive Cyanide	EPA SW-846 Chapter 7.3.3
Reactive Sulfide	EPA SW-846 Chapter 7.3.4
Corrosivity	EPA Method 9040B
Ignitability	EPA Method 1010
Chemical Agent Breakdown Products	SwRI SOPs[1]

A quality assurance/quality control (QA/QC) data review was performed on all samples. This review includes the evaluation of the following QA/QC elements: verification of compliance with the QAPP, sample preservation and handling procedures, holding times, initial and continuing calibrations, method reporting limits (MRL), QC results (i.e., surrogates, internal standards, matrix spike/matrix spike duplicates [MS/MSD], laboratory control samples [LCS]), rinsate blank, laboratory blank and trip blank contamination, data completeness, and data qualifiers assigned by the laboratory.

A data validation was performed on 10 percent of the samples. The data validation included all of the elements of the data review, as well as the evaluation of raw data and calculation verification of 10 percent of the analytical results.

The analytical data was validated following the guidelines and procedures outlined in the U.S. Environmental Protection Agency's (EPA's) *Contract Laboratory Program National Functional Guidelines for Organic Data Review* (dated October 1999) and *Inorganic Data Review* (dated February 1994), modified for the methods used and project-specific QA/QC criteria.

[1] SwRI SOPs are proprietary modifications of standard HPLC, ion chromatography, and GC/MS methods. A summary of the methods are available in Section 5.2 of the Quality Assurance Project Plan.

3.1 SAMPLE RECEIPT AND HOLDING TIMES

All samples were received at the laboratory intact and under proper chain-of-custody (COC) documentation. Samples were properly preserved and analyzed within the required holding times with the following exceptions.

- One of the coolers associated with sample delivery group (SDG) number 100867 (the sample IDs were not identified on the coolers receipt form) was received at the laboratory at a temperature of 6.5°C, which is outside the project-specific temperature range of 4°C ± 2°C. Since the project-specific temperature range was not grossly exceeded, and USEPA National Functional Guidelines does not require data qualification, the sample results were not qualified.
- Headspace was noted in two of three volatile organics analysis (VOA) vials for trip blank TB-9 and in three of three VOA vials for trip blank TB-7. The TB-9 and TB-7 trip blank results were non-detect for all volatile analytes. TB-9 results were not qualified because it is assumed that the analysis was conducted on the VOA vial that did not exhibit headspace. TB-7 results were qualified as estimated (UJ) because all three of the VOA vials exhibited headspace, as summarized in Table 1.
- The secondary dilution for sample SS-013-12 was performed two days outside of technical hold time (i.e., 14 days from date of collection). The diluted acetone result was qualified as estimated (J) in this sample, as summarized in Table 1.
- The laboratory noted that only one sample container was received for concrete sample DC-301. The sample consisted of large concrete pieces, which required pulverization by laboratory personnel in order to run the analyses. As a result of this action, the laboratory noted that common laboratory contaminants (i.e., methylene chloride, acetone, 2-butanone, and cyclohexane) might be detected in the sample. Sample DC-301 did exhibit laboratory contamination, however, the sample duplicate, DC-001 (the laboratory did not note similar sample preparation problems with this sample), exhibited similar concentrations of the same contaminants; therefore, the sample results were not qualified on the basis of the laboratory notation.

3.2 INSTRUMENT PERFORMANCE CHECK AND CALIBRATIONS

Instrument performance checks (e.g., bromofluorobenzene [BFB]) were performed at the beginning of each 12-hour period during which samples or standards were analyzed per project-specific requirements. The ion abundance criteria were met.

Initial calibrations (ICALs) were performed according to project-specific requirements. Average relative response factors (RRFs) for the target compounds were > 0.05 with the following exceptions.

- The ICALs associated with oil samples PD-001, PD-002, PD-301, and TB exhibited RFs < 0.05 for 2-butanone and 2-hexanone. The non-detect 2-butanone and 2-hexanone results were rejected (R), as summarized in Table 1.

- The ICAL associated with groundwater samples MW-003, MW-004, MW-303, and TB-021302 exhibited an RF < 0.05 for 2-butanone. The non-detect 2-butanone results were rejected (R), as summarized in Table 1.

The percent relative standard deviations (%RSDs) for the target compounds were ≤ 30.0 percent for standard linear calibrations or the coefficient of determinations were > 0.990 for least-square regression calibrations.

Continuing calibrations (CCAL) were performed before sample analysis and at the end of analytical sequences according to project-specific requirements. The response factors (RFs) for the target compounds were ≥ 0.05 with one exception.

- The CCAL associated with sample DC-001 exhibited an RRF < 0.05 for methyl acetate. The non-detect methyl acetate result was rejected (R), as summarized in Table 1.

The percent drift or percent differences (%Ds) for the continuing calibration check compounds (CCCs) were ≤ 20 percent and the average %Ds for all analytes were ≤ 20 percent.

3.3 BLANK REVIEW

Method Blank. The laboratory analyzed one method blank for each 12-hour analytical sequence, per project-specific requirements.

Bromoform and dibromochloromethane were detected in several method blanks, but were not detected in the associated samples, except for sample SS-033-01. Sample SS-033-01 exhibited results less than five times the contaminant concentrations and were qualified as non-detect (U) at the appropriate quantitation level, as summarized in Table 1.

Carbon disulfide, m,p-xylene and o-xylene were detected in one method blank. The associated sample results were non-detect for carbon disulfide, m,p-xylene and o-xylene results, except for sample DC-001. Sample DC-001 exhibited results less than five times the contaminant concentrations for m,p-xylene and o-xylene and were qualified as non-detect (U) at the appropriate quantitation level, as summarized in Table 1.

Trip Blank. A trip blank was included with each shipment of samples to be analyzed for VOCs, which met project-specific requirements.

Soil trip blanks TB-1, TB-2 and TB-4 exhibited acetone, methylene chloride, toluene, and styrene contamination. Soil trip blank TB-6 exhibited methylene chloride, toluene, and styrene contamination. Soil trip blank TB-10 exhibited methylene chloride, toluene, styrene, bromoform, and 1,2,4-trimethylbenzene contamination. Bromoform and 1,2,4-trimethylbenzene were not detect in the associated samples, and therefore did not require qualification. Associated samples that exhibited concentrations less than 10 times the blank contamination concentrations for acetone and methylene chloride, and less than 5 times for toluene and styrene, were qualified non-detect (U) at the appropriate quantitation level. Qualified results are summarized in Table 1.

Equipment Rinsate Blank. One equipment rinsate blank was collected for each 20 samples/ matrix, per project-specific requirements. Equipment rinsate blank SS-608-01 exhibited acetone, methylene chloride, chloroform, trichloroethene, toluene, tetrachloroethene, and 1,4-dichlorobenzene contamination. Equipment rinsate blank SS-623-01 exhibited acetone, methylene chloride, chloroform, toluene, and 1,4-dichlorobenzene contamination. Equipment

rinsate blank SS-628-11 exhibited acetone, methylene chloride, bromochloromethane, trichloroethene, toluene, and 1,4-dichlorobenzene contamination. Associated sample results that exhibited concentrations less than five times the equipment blank concentration (or less than 10 times for acetone and methylene chloride) were qualified as non-detect (U) at the appropriate quantitation level. Qualified results are summarized in Table 1.

3.4 SURROGATE/INTERNAL STANDARD RECOVERIES

All surrogate compound recoveries met project-specific criteria percent recovery (%R) of 70–130 percent for solid matrices and 80–120 percent for water matrices, with two exceptions.

- Surrogate recovery for the MS analysis of SS-008-05 exhibited low %R. The parent sample and MSD analysis exhibited %Rs within criteria; therefore the parent sample data was not qualified.
- Soil sample SS-033-01 exhibited three surrogates outside the quality control criteria. %R for the three late eluting surrogates were as follows: toluene-d8 (1,970 percent), ethylbenzene-d10 (507 percent), and bromofluorobenzene (0 percent). The remaining two surrogates were within QC limits. The VOC chromatogram indicates significant petroleum contamination, as confirmed by the NWTPH-Dx analysis. All non-detect analytes were rejected (R) and all detected analytes were qualified as estimated (J), as summarized in Table 1.

Internal Standard (IS) %Rs and retention times (RT) were evaluated for 10 percent of the data. Sample RTs did not vary more than 30 seconds from the associated 12-hour CCAL, nor did recoveries vary more than a factor of two (–50 percent to +100 percent) with one exception. The MS analysis of SS-008-05 exhibited low IS recovery for all four internal standards. The parent sample and MSD analysis exhibited IS recovery within criteria, and surrogate and MS/MSD recoveries were within criteria; therefore associated sample data was not qualified.

3.5 LABORATORY CONTROL SAMPLES

One laboratory control sample/laboratory control sample duplicate (LCS/LCSD) analysis was performed per 20 samples, as required by project-specific requirements. LCS/LCSD project-specific criteria are 75-125 percent for solid matrices and 80–120 percent for water matrices. Note that the project LCS limit are frequently more stringent than statistical limits derived by the laboratory. Samples associated with LCS/LCSD results outside the %R criteria (but above 10 percent) were qualified as estimate (J/UJ), as summarized in Table 1. One soil LCS/LCSD analysis exhibited less than 10%R for cyclohexane. Associated sample results were rejected (R) for cyclohexane. The rejected analyses are summarized in Table 1.

3.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATES

One matrix spike/matrix spike duplicate (MS/MSD) analysis was performed per 20 samples, as required by project-specific requirements. MS/MSD project-specific recovery criteria for solid and aqueous matrices is 70–130 percent. MS/MSD project-specific relative percent difference (RPD) criteria for aqueous matrices is <30 percent; solid matrices do not have a project-specific criteria. However, the laboratory-specific criteria of 26–39 percent RPD (analyte specific) were used to evaluate the data.

%R and RPDs for five target analytes were reported: 1,1-dichloroethene, benzene, trichloroethene, toluene, and chlorobenzene. The following MS/MSD samples exhibited results outside QC limits.

- The MS of soil sample SS-008-05 exhibited low %R for all five target analytes reported. The percent recovery for the associated MSD exhibited %Rs within QC criteria; therefore, the low %R exhibited in the analysis of the MS is considered an isolated occurrence and parent sample results were not qualified using professional judgment.
- The MS/MSD analysis of soil sample SS-028-11 exhibited low %R for benzene and toluene. The sample analysis exhibited concentrations of benzene and toluene at approximately half the concentration of the spike concentration. The MS/MSD non-conformance was attributed to the elevated levels of benzene and toluene present in the samples; therefore, the parent sample was not qualified.
- The MS/MSD analysis of sediment sample SD-001 exhibited low %R for 1,1-dichloroethene, benzene, trichloroethene, and toluene. The LCS/LCSD %R was within criteria, therefore the parent sample results were not qualified.

3.7 TARGET COMPOUND IDENTIFICATION AND QUANTITATION

Target compound identification and quantitation was evaluated for 10 percent of the samples. All target compound identifications and quantitations reviewed were acceptable. Relative retention times (RRT) were within ±0.06 RT units of the daily CCAL.

Analysis of samples SD-001 and SD-301 exhibited carbon tetrachloride concentrations above the calibration range. The samples were reanalyzed at a secondary dilution and the carbon tetrachloride results (44 µg/kg for primary sample SD-001 and 9.3 µg/kg for the field duplicate SD-301) were transcribed to the initial analysis and qualified "D" (result determined from secondary dilution), as summarized in Table 1.

Table 1
**SUMMARY OF DATA QUALIFICATION—
VOLATILE ORGANIC COMPOUNDS**

SAMPLE ID	SAMPLE TYPE	ANALYTE	QUALIFIER	RATIONAL
SS-009-08	Soil	Acetone, Methylene chloride, Toluene, Styrene	U	Trip blank contamination.
		Carbon disulfide, 1,2,4-Trichlorobenzene, Methyl acetate	UJ	LCS/LCSD %R < 75 percent
SS-009-11	Soil	Acetone, Methylene chloride, Toluene, Styrene	U	Trip blank contamination.
		Carbon disulfide, 1,2,4-Trichlorobenzene, Methyl acetate	UJ	LCS/LCSD %R < 75 percent
SS-010-08	Soil	Acetone, Methylene chloride, Toluene, Styrene	U	Trip blank contamination.
		Carbon disulfide, 1,2,4-trichlorobenzene, methyl acetate	UJ	LCS/LCSD %R < 75 percent
		2-Butanone	J	LCS/LCSD %R > 125 percent
SS-310-08	Soil	Acetone, Methylene chloride, Toluene, Styrene	U	Trip blank contamination.
		Carbon disulfide, 1,2,4-Trichlorobenzene, Methyl acetate	UJ	LCS/LCSD %R < 75 percent
SS-010-12	Soil	Acetone, Methylene chloride, Toluene, Styrene	U	Trip blank contamination.
		Carbon disulfide, 1,2,4-Trichlorobenzene, Methyl acetate	UJ	LCS/LCSD %R < 75 percent
SS-011-08	Soil	Acetone, Methylene chloride, Toluene, Styrene	U	Trip blank contamination.
		Carbon disulfide, 1,2,4-Trichlorobenzene, Methyl acetate	UJ	LCS/LCSD %R < 75 percent
SS-011-11	Soil	Acetone, Methylene chloride, Toluene, Styrene	U	Trip blank contamination.
		Carbon disulfide, 1,2,4-Trichlorobenzene, Methyl acetate	UJ	LCS/LCSD %R < 75 percent
SS-012-08	Soil	Acetone, Methylene chloride, Toluene, Styrene	U	Trip blank contamination.
		Carbon disulfide, 1,2,4-Trichlorobenzene, Methyl acetate	UJ	LCS/LCSD %R < 75 percent
		2-Butanone	J	LCS/LCSD %R > 125 percent
SS-012-11	Soil	Acetone, Methylene chloride, Toluene, Styrene	U	Trip blank contamination.
		Carbon disulfide, 1,2,4-Trichlorobenzene, Methyl acetate	UJ	LCS/LCSD %R < 75 percent
		2-Butanone	J	LCS/LCSD %R > 125 percent
SS-312-11	Duplicate of SS-012-11	Acetone, Methylene chloride, Toluene, Styrene	U	Trip blank contamination.
		Carbon disulfide, 1,2,4-Trichlorobenzene, Methyl acetate	UJ	LCS/LCSD %R < 75 percent
		2-Butanone	J	LCS/LCSD %R > 125 percent
TB-4	Soil Trip Blank	Cyclohexane	UJ	LCS/LCSD < 75 percent
SS-013-10	Soil	Acetone, Methylene chloride, Toluene, Styrene	U	Trip blank contamination.
		Carbon disulfide, 1,2,4-Trichlorobenzene, Methyl acetate	UJ	LCS/LCSD %R < 75 percent
		2-Butanone	J	LCS/LCSD %R > 125 percent
SS-013-12	Soil	Methylene chloride, toluene	U	Trip blank contamination
		Acetone	J	Analyzed out of hold time
		Carbon disulfide, 1,2,4-Trichlorobenzene, Methyl acetate	J/UJ	LCS/LCSD %R < 75 percent
SS-014-04	Soil	Acetone, Methylene chloride, Toluene	U	Trip blank contamination.
		Trichloroethene	U	Equipment rinsate contamination

Table 1 (Continued)
SUMMARY OF DATA QUALIFICATION—
VOLATILE ORGANIC COMPOUNDS

SAMPLE ID	SAMPLE TYPE	ANALYTE	QUALIFIER	RATIONAL
		Carbon disulfide, 1,2,4-Trichlorobenzene, Methyl acetate	J/UJ	LCS/LCSD %R < 75 percent
		2-Butanone	J	LCS/LCSD %R > 125 percent
SS-015-05	Soil	Acetone, Methylene chloride	U	Trip blank contamination.
		Carbon disulfide, 1,2,4-Trichlorobenzene, Methyl acetate	UJ	LCS/LCSD %R < 75 percent
SS-016-05	Soil	Acetone, Methylene chloride, Toluene, Styrene	U	Trip blank contamination.
		Carbon disulfide, 1,2,4-Trichlorobenzene, Methyl acetate	UJ	LCS/LCSD %R < 75 percent
		2-Butanone	J	LCS/LCSD %R > 125 percent
SS-001-01	Soil	Acetone, Methylene chloride, Toluene, Styrene	U	Trip blank contamination.
		Cyclohexane	UJ	LCS/LCSD %R < 75 percent
SS-003-01	Soil	Acetone, Methylene chloride, Toluene	U	Trip blank contamination.
		Trichloroethene, 1,4-Dichlorobenzene	U	Equipment rinsate contamination
		Cyclohexane	UJ	LCS/LCSD %R < 75 percent
		Methyl acetate	J	LCS/LCSD %R > 125 percent
SS-003-05	Soil	Acetone, Methylene chloride, Toluene	U	Trip blank contamination.
		Cyclohexane	UJ	LCS/LCSD %R < 75 percent
SS-030-10	Soil	Acetone, Methylene chloride, Toluene, Styrene	U	Trip blank contamination.
		Cyclohexane	UJ	LCS/LCSD %R < 75 percent
SS-031-10	Soil	Acetone, Methylene chloride, Toluene, Styrene	U	Trip blank contamination.
		Cyclohexane	UJ	LCS/LCSD %R < 75 percent
SS-032-01	Soil	Acetone, Methylene chloride, Toluene	U	Trip blank contamination.
		Cyclohexane	UJ	LCS/LCSD %R < 75 percent
SS-032-14	Soil	Acetone, Methylene chloride, Toluene, Styrene	U	Trip blank contamination.
		Cyclohexane	UJ	LCS/LCSD %R < 75 percent
SS-002-01	Soil	Acetone, Methylene chloride, Toluene, Styrene	U	Trip blank contamination.
		Cyclohexane	UJ	LCS/LCSD %R < 75 percent
SS-021-04	Soil	Acetone, Methylene chloride, Toluene	U	Trip blank contamination.
		Cyclohexane	UJ	LCS/LCSD %R < 75 percent
SS-321-04	Duplicate of SS-021-04	Acetone, Methylene chloride, Toluene, Styrene	U	Trip blank contamination.
		Cyclohexane	UJ	LCS/LCSD %R < 75 percent
TB-1	Soil Trip Blank	Cyclohexane	UJ	LCS/LCSD %R < 75 percent
SS-008-01	Soil	Acetone, Methylene chloride, Toluene	U	Trip blank contamination.
		Carbon disulfide, Dibromochloromethane, Cyclohexane	UJ	LCS/LCSD %R < 75 percent
		2-Butanone	J	LCS/LCSD %R > 125 percent
SS-008-05	Soil	Acetone, Methylene chloride, Toluene, Styrene	U	Trip blank contamination.
		Cyclohexane	UJ	LCS/LCSD %R < 75 percent
SS-608-01	Water Rinsate Blank		None	
SS-007-01	Soil	Acetone, Methylene chloride, Toluene, Styrene	U	Trip blank contamination.
		Carbon disulfide, Dibromochloromethane, Cyclohexane	UJ	LCS/LCSD %R < 75 percent

Table 1 (Continued)
SUMMARY OF DATA QUALIFICATION—
VOLATILE ORGANIC COMPOUNDS

SAMPLE ID	SAMPLE TYPE	ANALYTE	QUALIFIER	RATIONAL
SS-007-05	Soil	Acetone, Methylene chloride, Toluene, Styrene	U	Trip blank contamination.
		Carbon disulfide, Dibromochloromethane, Cyclohexane	UJ	LCS/LCSD %R < 75 percent
		2-Butanone	J	LCS/LCSD %R > 125 percent
SS-006-01	Soil	Acetone, Methylene chloride, Toluene	U	Trip blank contamination.
		Carbon disulfide, Dibromochloromethane, Cyclohexane	UJ	LCS/LCSD %R < 75 percent
		2-Butanone, Methyl acetate	J	LCS/LCSD %R > 125 percent
SS-006-05	Soil	Acetone, Methylene chloride, Toluene, Styrene	U	Trip blank contamination.
		Carbon disulfide, Dibromochloromethane, Cyclohexane	UJ	LCS/LCSD %R < 75 percent
SS-004-03	Soil	Acetone, Methylene chloride, Toluene, Styrene	U	Trip blank contamination.
		Carbon disulfide, Dibromochloromethane, Cyclohexane	J/UJ	LCS/LCSD %R < 75 percent
SS-004-09	Soil	Acetone, Methylene chloride, Toluene, Styrene	U	Trip blank contamination.
		Carbon disulfide, Dibromochloromethane, Cyclohexane	J/UJ	LCS/LCSD %R < 75 percent
		2-Butanone	J	LCS/LCSD %R > 125 percent
TB-2	Soil Trip Blank	Cyclohexane	UJ	LCS/LCSD < 75 percent
TB-3	Water Trip Blank		None	
MW-001	Monitoring Well	Carbon disulfide, 2-Hexanone	UJ	LCS/LCSD %R < 80 percent
SS-623-01	Rinsate Blank	Carbon disulfide, 2-Hexanone	UJ	LCS/LCSD %R < 80 percent
SS-628-11	Rinsate Blank	Carbon disulfide, 2-Hexanone	UJ	LCS/LCSD %R < 80 percent
TB-8	Water Trip Blank	Carbon disulfide, 2-Hexanone	UJ	LCS/LCSD %R < 80 percent
MC-001	Microwell	Chloroform	U	Equipment Blank Contamination
		Carbon disulfide, 2-Hexanone	UJ	LCS/LCSD %R < 80 percent
MC-004	Microwell	Carbon disulfide, 2-Hexanone	UJ	LCS/LCSD %R < 80 percent
MC-005	Microwell	Carbon disulfide, 2-Hexanone	UJ	LCS/LCSD %R < 80 percent
MW-005	Monitoring Well	Toluene	U	Equipment Blank Contamination
		Carbon disulfide, 2-Hexanone	UJ	LCS/LCSD %R < 80 percent
MW-006	Monitoring Well	Carbon disulfide, 2-Hexanone	UJ	LCS/LCSD %R < 80 percent
TB-9	Water Trip Blank	Carbon disulfide, 2-Hexanone	UJ	LCS/LCSD %R < 80 percent
MC-002	Microwell	Carbon disulfide, 2-Hexanone	UJ	LCS/LCSD %R < 80 percent
MC-302	Microwell	Acetone	U	Equipment Blank Contamination
		Carbon disulfide, 2-Hexanone	UJ	LCS/LCSD %R < 80 percent
MC-602	Rinsate Blank	Carbon disulfide, 2-Hexanone	UJ	LCS/LCSD %R < 80 percent
MC-003	Microwell	Carbon disulfide, 2-Hexanone	UJ	LCS/LCSD %R < 80 percent
MW-002	Monitoring Well	Carbon disulfide, 2-Hexanone	UJ	LCS/LCSD %R < 80 percent
TB-7	Water Trip Blank	All analytes	UJ	VOA vial headspace
		Carbon disulfide, 2-Hexanone	UJ	LCS/LCSD %R < 80 percent
SS-001-12	Soil	Acetone	J	LCS/LCSD %R > 125 percent
		Cyclohexane	R	LCS/LCSD %R < 10 percent
		Carbon disulfide	UJ	LCS/LCSD %R < 75 percent
		Methylene chloride, Toluene, Styrene	U	Trip Blank contamination

Table 1 (Continued)
SUMMARY OF DATA QUALIFICATION—
VOLATILE ORGANIC COMPOUNDS

SAMPLE ID	SAMPLE TYPE	ANALYTE	QUALIFIER	RATIONAL
SS-005-01	Soil	Acetone	J	LCS/LCSD %R > 125 percent
		Carbon disulfide	J	LCS/LCSD %R < 75 percent
		Cyclohexane	R	LCS/LCSD %R < 10 percent
		Methylene chloride, Toluene	U	Trip Blank contamination
SS-026-04	Soil	Carbon disulfide	J	LCS/LCSD %R < 75 percent
		Methylene chloride	U	Trip Blank contamination
		Acetone	U	Equipment Blank contamination
		Cyclohexane	R	LCS/LCSD %R < 10 percent
SS-026-05	Soil	Acetone	J	LCS/LCSD %R > 125 percent
		Carbon disulfide	J	LCS/LCSD %R < 75 percent
		Cyclohexane	R	LCS/LCSD %R < 10 percent
		Methylene chloride, Toluene	U	Trip Blank contamination
		Trichloroethene	U	Equipment Blank contamination
SS-026-07	Soil	Acetone	J	LCS/LCSD %R > 125 percent
		Cyclohexane	R	LCS/LCSD %R < 10 percent
		Carbon disulfide	UJ	LCS/LCSD %R < 75 percent
		Methylene chloride, Toluene	U	Trip and Equipment Blank contamination
SS-027-04	Soil	Acetone, 2-Butanone	J	LCS/LCSD %R > 125 percent
		Carbon disulfide	J	LCS/LCSD %R < 75 percent
		Cyclohexane	R	LCS/LCSD %R < 10 percent
		Methylene chloride, Toluene	U	Trip and Equipment Blank contamination
SS-027-13	Soil	Acetone, 2-Butanone	J	LCS/LCSD %R > 125 percent
		Carbon disulfide	J	LCS/LCSD %R < 75 percent
		Cyclohexane	R	LCS/LCSD %R < 10 percent
		Methylene chloride, Toluene	U	Trip and Equipment Blank contamination
SS-327-04	Duplicate of SS-027-04	Acetone, 2-Butanone	J	LCS/LCSD %R > 125 percent
		Carbon disulfide	J	LCS/LCSD %R < 75 percent
		Cyclohexane	R	LCS/LCSD %R < 10 percent
		Methylene chloride	U	Trip and Equipment Blank contamination
		Toluene	U	Trip Blank contamination
		1,4-Dichlorobenzene	U	Equipment Blank contamination
SS-028-05	Soil	Acetone, 2-Butanone	J	LCS/LCSD %R > 125 percent
		Carbon disulfide	J	LCS/LCSD %R < 75 percent
		Cyclohexane	R	LCS/LCSD %R < 10 percent
		Methylene chloride	U	Trip and Equipment Blank contamination
SS-028-11	Soil	Acetone	J	LCS/LCSD %R > 125 percent
		Carbon disulfide	J	LCS/LCSD %R < 75 percent
		Cyclohexane	R	LCS/LCSD %R < 10 percent
		Methylene chloride, Toluene	U	Trip Blank contamination
TB-6	Soil Trip Blank		None	

Table 1 (Continued)
SUMMARY OF DATA QUALIFICATION—
VOLATILE ORGANIC COMPOUNDS

SAMPLE ID	SAMPLE TYPE	ANALYTE	QUALIFIER	RATIONAL
SS-033-04	Soil	Methylene chloride	U	Trip and Equipment Blank contamination
		Acetone, 2-Butanone	J	LCS/LCSD %R > 125 percent
		Carbon disulfide	J	LCS/LCSD %R < 75 percent
		Cyclohexane	R	LCS/LCSD %R < 10 percent
		Toluene	U	Trip Blank contamination
DC-001	Concrete	Methyl acetate	R	CCV RF < 0.05
		Acetone, 2-Butanone	J	LCS/LCSD %R > 125 percent
		Cyclohexane	R	LCS/LCSD %R < 10 percent
		m,p-Xylene, o-Xylene, Carbon disulfide	U	Method Blank contamination
		Methylene chloride	U	Trip Blank contamination
		Toluene	U	Trip Blank and Equipment Rinsate Blank contamination
DC-301	Duplicate of DC-001	Carbon disulfide	J	LCS/LCSD %R < 75 percent
		Acetone, 2-Butanone	J	LCS/LCSD %R > 125 percent
		Cyclohexane	R	LCS/LCSD %R < 10 percent
		Methylene chloride	U	Trip Blank contamination
		Toluene	U	Trip Blank and Equipment Blank contamination
SD-001	Sediment	Carbon disulfide	J	LCS/LCSD %R < 75 percent
		Acetone, 2-Butanone	J	LCS/LCSD %R > 125 percent
		Cyclohexane	R	LCS/LCSD %R < 10 percent
		Methylene chloride, Toluene	U	Trip Blank contamination
		Carbon tetrachloride	D	Result reported from secondary dilution
SD-301	Duplicate of SD-001	Carbon disulfide	J	LCS/LCSD %R < 75 percent
		Acetone, 2-Butanone	J	LCS/LCSD %R > 125 percent
		Cyclohexane	R	LCS/LCSD %R < 10 percent
		Methylene chloride, Toluene	U	Trip Blank contamination
		Carbon tetrachloride	D	Result reported from secondary dilution
SS-022-01	Soil	Carbon disulfide	J	LCS/LCSD %R < 75 percent
		Acetone, 2-Butanone	J	LCS/LCSD %R > 125 percent
		Cyclohexane	R	LCS/LCSD %R < 10 percent
		Methylene chloride, Toluene	U	Trip and Equipment Blank contamination
SS-023-01	Soil	Carbon disulfide	J	LCS/LCSD %R < 75 percent
		Acetone, 2-Butanone	J	LCS/LCSD %R > 125 percent
		Cyclohexane	R	LCS/LCSD %R < 10 percent
		Methylene chloride	U	Trip and Equipment Blank contamination
		Toluene	U	Trip Blank contamination
SS-323-01	Duplicate of SS-023-01	Carbon disulfide	J	LCS/LCSD %R < 75 percent
		Acetone, 2-Butanone	J	LCS/LCSD %R > 125 percent
		Cyclohexane	R	LCS/LCSD %R < 10 percent
		Methylene chloride, Toluene	U	Trip and Equipment Blank contamination

Table 1 (Continued)
SUMMARY OF DATA QUALIFICATION—
VOLATILE ORGANIC COMPOUNDS

SAMPLE ID	SAMPLE TYPE	ANALYTE	QUALIFIER	RATIONAL
SS-024-01	Soil	Carbon disulfide	J	LCS/LCSD %R < 75 percent
		Acetone, 2-Butanone	J	LCS/LCSD %R > 125 percent
		Cyclohexane	R	LCS/LCSD %R < 10 percent
		Methylene chloride	U	Trip and Equipment Blank contamination
		Toluene	U	Trip Blank contamination
SS-025-01	Soil	Carbon disulfide	J	LCS/LCSD %R < 75 percent
		Acetone, 2-Butanone	J	LCS/LCSD %R > 125 percent
		Cyclohexane	R	LCS/LCSD %R < 10 percent
		Methylene chloride, Toluene	U	Trip and Equipment Blank contamination
SS-029-05	Soil	Carbon disulfide	J	LCS/LCSD %R < 75 percent
		Acetone, 2-Butanone	J	LCS/LCSD %R > 125 percent
		Cyclohexane	R	LCS/LCSD %R < 10 percent
		Methylene chloride, Toluene	U	Trip and Equipment Blank contamination
SS-029-10	Soil	Carbon disulfide	UJ	LCS/LCSD %R < 75 percent
		Acetone	J	LCS/LCSD %R > 125 percent
		Cyclohexane	R	LCS/LCSD %R < 10 percent
		Methylene chloride, Toluene	U	Trip and Equipment Blank contamination
SS-033-01	Soil	Bromoform, Dibromochloromethane	U	Method Blank contamination
		All detected analytes	J	Surrogates %R: 1970 percent, 501 percent and 0 percent
		All non-detect analytes	R	Surrogates %R: 1970 percent, 501 percent and 0 percent
TB-10	Trip Blank		None	
PD-001	Oil	2-Butanone, 2-Hexanone	R	ICAL RF < 0.05
PD-002	Oil	2-Butanone, 2-Hexanone	R	ICAL RF < 0.05
PD-301	Duplicate of PD-001	2-Butanone, 2-Hexanone	R	ICAL RF < 0.05
TB	Trip Blank	2-Butanone, 2-Hexanone	R	ICAL RF < 0.05
MW-003	Groundwater	2-Butanone	R	ICAL RF < 0.05
MW-004	Groundwater	2-Butanone	R	ICAL RF < 0.05
MW-303	Duplicate of MW-003	2-Butanone	R	ICAL RF < 0.05
TB-021302	Trip Blank	2-Butanone	R	ICAL RF < 0.05

4.1 SAMPLE RECEIPT AND HOLDING TIMES

All samples were received at the laboratory intact and under proper chain-of-custody (COC) documentation. Samples were properly preserved and analyzed within the required holding times with the following exception:

- One of the coolers associated with SDG number 100867 (the sample IDs were not identified on the coolers receipt form) was received at the laboratory at a temperature of 6.5°C, which is outside the project-specific temperature range of 4°C $\pm$ 2°C. Because the project-specific temperature range was not grossly exceeded, and EPA National Functional Guidelines do not require data qualification, the sample results were not qualified.

4.2 INSTRUMENT PERFORMANCE CHECK AND CALIBRATIONS

Instrument performance checks (i.e., decafluorotriphenylphosphine [DFTPP]) were performed at the beginning of each 12-hour period during which samples or standards were analyzed per project-specific requirements. Three of the five DFTPPs exhibited low ion abundance for mass ion 51. EPA National Functional Guidelines does not consider the relative abundance of this ion critical. All other ion abundance criteria were met; therefore, sample results were not qualified on the basis of DFTPP non-conformance.

ICALs were performed according to project-specific requirements. RRFs for the target compounds were $\geq$ 0.05 with the exception of caprolactum. All associated sample results for caprolactum were non-detect; therefore, all of the results were rejected (R) as summarized in Table 2. The %RSDs for the target compounds were within the project-specific criteria of $\leq$ 30 percent.

CCALs were performed according to project-specific requirements, which is at the beginning of each 12 hour analytical sequence and at the end of the analytical sequence. The RFs for the target compounds were $\geq$0.05 with the exception of caprolactum and benzaldehyde. Caprolactum was previously rejected due to low response in the ICAL. All associated samples exhibited non-detect results for benzaldehyde and were rejected (R), as summarized in Table 2.

The %Ds for the calibration check compounds (CCCs) were within the project-specific criteria of $\leq$ 20 percent, except for one of the following CCCs: fluoranthene, 2,4,6-trichlorophenol, hexachlorobutadiene, and acenapthene. The average %D for all analytes was $\leq$ 20 percent for each CCAL; therefore data were not qualified.

4.3 BLANK REVIEW

Method Blank. The laboratory extracted/analyzed one method blank for each analytical batch, per project-specific requirements. Common laboratory contaminants (i.e., phthalates) were detected in all method blanks. Associated sample results exhibiting concentrations less than ten times the method blank contamination were qualified non-detect (U) at the appropriate quantitation level. Affected samples are summarized in Table 2.

Equipment Rinsate Blank. One equipment rinsate blank was collected for each twenty samples per project-specific requirements. All equipment rinsate blanks exhibited contamination.

- Soil rinsate blank SS-608-01 exhibited 1,4-dichlorobenzene, naphthalene, di-n-butylphthalate, acetophenone, and benzaldehyde contamination.
- Soil rinsate blank SS-628-11 exhibited 1,4-dichlorobenzene, naphthalene, di-n-butylphthalate, bis(2-ethylhexyl)phthalate, acetophenone, and benzaldehyde contamination.
- Soil rinsate blank US-603 exhibited 1,4-dichlorobenzene, naphthalene, dimethylphthalate, diethylphthalate, di-n-butylphthalate, bis(2-ethylhexyl)phthalate, acetophenone, and benzaldehyde contamination.
- Water rinsate blank MC-602 exhibited 1,4-dichlorobenzene, naphthalene, 2-methylnaphthalene, dimethylphthalate, diethylphthalate, phenanthrene, di-n-butylphthalate, acetophenone, bis(2-ethylhexyl)phthalate, and benzaldehyde contamination.

Associated sample results that exhibited concentrations less than five times the blank contamination concentration (or less than 10 times for phthalate compounds) were qualified as not detected (U) at the appropriate quantitation level. Affected samples are summarized in Table 2.

4.4 SURROGATE/INTERNAL STANDARD RECOVERIES

All surrogate recoveries met project-specific %R criteria of 45–135 percent recovery for base-neutral compounds and 35–140 percent for acid-phenol compounds with the following exceptions.

- Soil sample SS-021-04 and its field duplicate SS-321-04 exhibited zero percent recovery for acid-phenol surrogate 2,4,6-tribomophenol. Detected acid-phenol compound results for these two samples were qualified as estimated (J), while all non-detect acid-phenol compounds were rejected (R), as summarized in Table 2.
- Concrete sample DC-001 and its field duplicate DC-301 exhibited low recovery for two acid-phenol surrogates (phenol-d5 and 2-fluorophenol), and zero percent recovery for 2,4,6-tribromophenol. Acid-phenol compounds are difficult to recover in concrete samples due to the basic nature (i.e., high pH) of the matrix. Also, the chromatograph for both samples exhibited significant matrix interference. Detected acid-phenol compound results for these two samples were qualified as estimated (J), while all non-detect acid-phenol compounds were rejected (R), as summarized in Table 2.
- Oil sample PD-001 and field duplicate PD-301 exhibited zero percent recovery for both base-neutral and acid-phenol surrogates. All detected analytes were qualified as estimated (J), while all non-detect analytes were rejected (R), as summarized in Table 2.

IS %Rs and RTs were evaluated for 10 percent of the data. Evaluated IS responses were within –50 percent to +100 percent of the responses of the associated 12-hour CCAL. IS RTs did not vary by more than $\pm$ 30 seconds from the retention time of the associated 12-hour CCAL with the following exception. IS perylene-d12 exhibited a RT > $\pm$ 30 seconds in several samples. The sample results were not qualified because no false negative or false positive compound identifications were identified.

4.5 LABORATORY CONTROL SAMPLES

One LCS/LCSD %R analysis was performed per 20 samples, as required by project-specific requirements. LCS/LCSD project-specific recovery criteria are 60-120 percent, 45-135 percent, and 50-150 percent, depending upon the compound. All solid LCS/LCSD %Rs were within the criteria, while the water %Rs exhibited several outliers. Associated water samples were qualified as estimated (J/UJ) for the affected analytes, as summarized in Table 2.

4.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATES

One MS/MSD analysis was performed per 20 samples, as required by project-specific requirements. MS/MSD project-specific recovery criteria for solid and aqueous matrices is 45–135 percent. MS/MSD project-specific RPD criteria is $\leq$ 50 percent for aqueous matrices and $\leq$ 60 percent for solids. %Rs and RPDs were within the criteria with the following exceptions.

- Phenol and 4-nitrophenol exhibited %Rs < 45 percent in the MS/MSD analysis of groundwater sample MW-001. Phenol and 4-nitrophenol were not detected in the primary sample; therefore the MS/MSD nonconformance may be indicative of low bias, since the associated LCS exhibited the same bias for these two compounds. Associated samples were qualified as estimated (J/UJ), as summarized in Table 2.
- 4-Nitrophenol and pentachlorophenol exhibited %Rs < 45 percent in the MS/MSD analysis of soil sample SS-028-11. The concentration of pentachlorophenol in the primary sample was more than 16 times the spike, therefore the non-conformance is attributed to only this sample. Results were not qualified on the basis of this MS/MSD non-conformance because the associated LCS was within QC limits.
- Phenol, 2-chlorophenol, 4-chloro-3-methylphenol, 4-nitrophenol, and pentachlorphenol exhibited %Rs < 45 percent in the MS/MSD analysis of concrete sample DC-001. The non-conformance is attributed to the basic nature (i.e., high pH) of the matrix and the difficulty in recovering acid-phenol compounds. The associated samples were previously qualified as estimated (J) for detected acid-phenol compounds or rejected (R) for non-detect acid-phenol compounds based on low surrogate recovery, as noted in Section 4.4. The associated samples were not further qualified.
- Pentachlorophenol, n-nitroso-di-n-propylamine, and pyrene exhibited %Rs < 45 percent in the MS/MSD analysis of sediment sample SD-001. Pyrene also exhibited an RPD above the QC limit of < 60 percent. Sample results were not qualified based on this MS/MSD non-conformance since the associated LCS was within QC limits.

4.7 TARGET COMPOUND IDENTIFICATION AND QUANTITATION

Target compound quantitation was evaluated for 10 percent of the samples. No data were qualified on the basis of compound quantitation.

Compound identification was evaluated for 100 percent of the samples. RRTs were within ± 0.06 RT units of the daily calibration, however several compound spectra did not meet method identification criteria (i.e., relative intensities of the major ions within ± 20 percent of the

corresponding ions in the reference spectra). Analytes that did not meet spectra identification criteria were qualified as non-detect (U) at the appropriate quantitation level, as summarized in Table 2.

Table 2
SUMMARY OF DATA QUALIFICATION—
SEMIVOLATILE ORGANIC COMPOUNDS

SAMPLE ID	SAMPLE TYPE	ANALYTE	QUALIFIER	RATIONAL
SS-009-08	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Di-n-butylphthalate, Butylbenzylphthalate, bis(2-Ethylhexyl)phthalate	U	Method blank contamination
SS-009-11	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Di-n-butylphthalate, Butylbenzylphthalate, bis(2-Ethylhexyl)phthalate	U	Method blank contamination
SS-010-08	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Di-n-butylphthalate, bis(2-Ethylhexyl)phthalate	U	Method blank contamination
SS-310-08	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Di-n-butylphthalate, Butylbenzylphthalate, bis(2-Ethylhexyl)phthalate	U	Method blank contamination
SS-010-12	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Di-n-butylphthalate, Butylbenzylphthalate, bis(2-Ethylhexyl)phthalate	U	Method blank contamination
SS-011-08	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Di-n-butylphthalate, Butylbenzylphthalate, bis(2-Ethylhexyl)phthalate	U	Method blank contamination
SS-011-11	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Di-n-butylphthalate, Butylbenzylphthalate, bis(2-Ethylhexyl)phthalate	U	Method blank contamination
SS-012-08	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Di-n-butylphthalate, Butylbenzylphthalate, bis(2-Ethylhexyl)phthalate	U	Method blank contamination
SS-012-11	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Di-n-butylphthalate, Butylbenzylphthalate, bis(2-Ethylhexyl)phthalate	U	Method blank contamination
SS-312-11	Duplicate of SS-012-11	Caprolactum	R	ICAL RF < 0.05
		Di-n-butylphthalate, Butylbenzylphthalate, bis(2-Ethylhexyl)phthalate	U	Method blank contamination
SS-013-10	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Di-n-butylphthalate, bis(2-Ethylhexyl)phthalate	U	Method blank contamination
		Napthalene	U	Rinsate blank contamination
SS-013-12	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Di-n-butylphthalate, bis(2-Ethylhexyl)phthalate	U	Method blank contamination

Table 2 (Continued)
SUMMARY OF DATA QUALIFICATION—
SEMIVOLATILE ORGANIC COMPOUNDS

SAMPLE ID	SAMPLE TYPE	ANALYTE	QUALIFIER	RATIONAL
SS-014-04	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Di-n-butylphthalate, bis(2-Ethylhexyl)phthalate	U	Method blank contamination
SS-015-05	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Di-n-butylphthalate, Butylbenzylphthalate, bis(2-Ethylhexyl)phthalate	U	Method blank contamination
SS-016-05	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Di-n-butylphthalate, Butylbenzylphthalate, bis(2-Ethylhexyl)phthalate	U	Method blank contamination
SS-001-01	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Di-n-butylphthalate, Butylbenzylphthalate, bis(2-Ethylhexyl)phthalate, Di-n-octylphthalate	U	Method blank contamination
SS-003-01	Soil	Acenapthene	U	Poor spectra
		Caprolactum	R	ICAL RF ≤ 0.05
		Di-n-butylphthalate, bis(2-Ethylhexyl)phthalate	U	Method blank contamination
		Napthalene	U	Rinsate blank contamination
SS-003-05	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Di-n-butylphthalate, Butylbenzylphthalate, bis(2-Ethylhexyl)phthalate	U	Method blank contamination
SS-030-10	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Di-n-butylphthalate, Butylbenzylphthalate, bis(2-Ethylhexyl)phthalate	U	Method blank contamination
SS-031-10	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Di-n-butylphthalate, Butylbenzylphthalate, bis(2-Ethylhexyl)phthalate	U	Method blank contamination
SS-032-01	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Chrysene	U	Poor spectra
		Di-n-butylphthalate, bis(2-Ethylhexyl)phthalate	U	Method blank contamination
SS-032-14	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Di-n-butylphthalate, bis(2-Ethylhexyl)phthalate	U	Method blank contamination
SS-002-01	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Di-n-butylphthalate, bis(2-Ethylhexyl)phthalate	U	Method blank contamination
SS-021-04	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Napthalene	U	Rinsate blank contamination
		Detected acid-phenol compounds	J	Surrogate recovery below 10%
		Non-detect acid-phenol compounds	R	Surrogate recovery below 10%

Table 2 (Continued)
SUMMARY OF DATA QUALIFICATION—
SEMIVOLATILE ORGANIC COMPOUNDS

SAMPLE ID	SAMPLE TYPE	ANALYTE	QUALIFIER	RATIONAL
SS-321-04	Duplicate of SS-021-04	Caprolactum	R	ICAL RF ≤ 0.05
		Napthalene	U	Rinsate blank contamination
		Detected acid-phenol compounds	J	Surrogate recovery below 10%
		Non-detect acid-phenol compounds	R	Surrogate recovery below 10%
SS-008-01	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Di-n-butylphthalate, bis(2-Ethylhexyl)phthalate	U	Method blank contamination
SS-008-05	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Di-n-butylphthalate, bis(2-Ethylhexyl)phthalate	U	Method blank contamination
SS-608-01	Water Rinsate Blank	Caprolactum	R	ICAL RF < 0.05
SS-007-01	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Di-n-butylphthalate, bis(2-Ethylhexyl)phthalate	U	Method blank contamination
SS-007-05	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Di-n-butylphthalate, bis(2-Ethylhexyl)phthalate	U	Method blank contamination
SS-006-01	Soil	Chrysene	U	Poor spectra
		Caprolactum	R	ICAL RF ≤ 0.05
		Di-n-butylphthalate, bis(2-Ethylhexyl)phthalate	U	Method blank contamination
SS-006-05	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Di-n-butylphthalate, bis(2-Ethylhexyl)phthalate	U	Method blank contamination
SS-004-03	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Di-n-butylphthalate, bis(2-Ethylhexyl)phthalate	U	Method blank contamination
SS-004-09	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Di-n-butylphthalate, bis(2-Ethylhexyl)phthalate	U	Method blank contamination
MW-001	Monitoring Well	Caprolactum	J	ICAL RF ≤ 0.05
		Phenanthrene, Caprolactum	U	Poor spectra
		Naphthalene, Dimethylphthlate, Diethylphthalate	U	Rinsate blank contamination
		Di-n-butylphthalate, bis(2-Ethylhexyl)phthalate	U	Method blank and rinsate contamination
		Phenol, bis(2-Chloroethyl)ether, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,2-Dichlorobenzene, Hexachloroethane, Nitrobenzene, 1,2,4-Trichlorobenzene, Naphthalene,	UJ	LCS/LCSD %R < 60%

Table 2 (Continued)
SUMMARY OF DATA QUALIFICATION—
SEMIVOLATILE ORGANIC COMPOUNDS

SAMPLE ID	SAMPLE TYPE	ANALYTE	QUALIFIER	RATIONAL
		4-Chloroaniline, Hexachlorobutadiene, 2-Methylnaphthalene, 2-Chloronaphthalene, 4-Nitrophenol, Dibenzofuran, 4-Chlorophenylphenylether, Hexachlorobenzene, 3,3'-Dichlorobenzidine, 1,1-Biphenyl, Benzaldehyde		
		Phenol, 4-Nitrophenol	UJ	MS/MSD %R < 45%
SS-628-11	Rinsate Blank	Caprolactum	R	ICAL RF ≤ 0.05
US-603	Equipment Rinsate Blank	Caprolactum	R	ICAL RF ≤ 0.05
		Phenol, bis(2-Chloroethyl)ether, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,2-Dichlorobenzene, Hexachloroethane, Nitrobenzene, 1,2,4-Trichlorobenzene, Naphthalene, 4-Chloroaniline, Hexachlorobutadiene, 2-Methylnaphthalene, 2-Chloronaphthalene, 4-Nitrophenol, Dibenzofuran, 4-Chlorophenylphenylether, Hexachlorobenzene, 3,3'-Dichlorobenzidine, 1,1-Biphenyl, Benzaldehyde	J/UJ	LCS/LCSD %R < 60%
MC-001	Microwell	Caprolactum	R	ICAL RF ≤ 0.05
		Naphthalene	U	Rinsate Contamination
		Di-n-butylphthalate, bis(2-Ethylhexyl)phthalate	U	Method Blank and Rinsate Contamination
		Phenol, bis(2-Chloroethyl)ether, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,2-Dichlorobenzene, Hexachloroethane, Nitrobenzene, 1,2,4-Trichlorobenzene, Naphthalene, 4-Chloroaniline,	J/UJ	LCS/LCSD %R < 60%

Table 2 (Continued)
SUMMARY OF DATA QUALIFICATION—
SEMIVOLATILE ORGANIC COMPOUNDS

SAMPLE ID	SAMPLE TYPE	ANALYTE	QUALIFIER	RATIONAL
		Hexachlorobutadiene, 2-Methylnaphthalene, 2-Chloronaphthalene, 4-Nitrophenol, Dibenzofuran, 4-Chlorophenyl-phenylether, Hexachlorobenzene, 3,3'-Dichlorobenzidine, 1,1-Biphenyl, Benzaldehyde,		
		Phenol, 4-Nitrophenol	UJ	MS/MSD %R < 45%
MC-004	Microwell	Caprolactum	R	ICAL RF ≤ 0.05
		Dimethylphthalate, Diethylphthalate	U	Rinsate contamination
		Di-n-butylphthalate bis(2-Ethylhexyl)phthalate	U	Method blank and rinsate contamination
		Phenol, bis(2-Chloroethyl)ether, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,2-Dichlorobenzene, Hexachloroethane, Nitrobenzene, 1,2,4-Trichlorobenzene, Naphthalene, 4-Chloroaniline, Hexachlorobutadiene, 2-Methylnaphthalene, 2-Chloronaphthalene, 4-Nitrophenol, Dibenzofuran, 4-Chlorophenyl-phenylether, Hexachlorobenzene, 3,3'-Dichlorobenzidine, 1,1-Biphenyl, Benzaldehyde,	UJ	LCS/LCSD %R < 60%
		Phenol, 4-Nitrophenol	UJ	MS/MSD %R < 45%
MC-005	Microwell	Caprolactum	R	ICAL RF ≤ 0.05
		Acetophenone	U	Rinsate contamination
		Di-n-butylphthalate bis(2-Ethylhexyl)phthalate	U	Method blank and rinsate contamination
		Phenol, bis(2-Chloroethyl)ether, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,2-Dichlorobenzene, Hexachloroethane, Nitrobenzene, 1,2,4-Trichlorobenzene,	UJ	LCS/LCSD %R < 60%

Table 2 (Continued)
SUMMARY OF DATA QUALIFICATION—
SEMIVOLATILE ORGANIC COMPOUNDS

SAMPLE ID	SAMPLE TYPE	ANALYTE	QUALIFIER	RATIONAL
		Naphthalene, 4-Chloroaniline, Hexachlorobutadiene, 2-Methylnaphthalene, 2-Chloronaphthalene, 4-Nitrophenol, Dibenzofuran, 4-Chlorophenyl-phenylether, Hexachlorobenzene, 3,3'-Dichlorobenzidine, 1,1-Biphenyl, Benzaldehyde,		
		Phenol, 4-Nitrophenol	UJ	MS/MSD %R < 45%
MW-005	Monitoring Well	Caprolactum	R	ICAL RF ≤ 0.05
		Di-n-butylphthalate bis(2-Ethylhexyl)phthalate	U	Method blank and rinsate contamination
		Phenol, bis(2-Chloroethyl)ether, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,2-Dichlorobenzene, Hexachloroethane, Nitrobenzene, 1,2,4-Trichlorobenzene, Naphthalene, 4-Chloroaniline, Hexachlorobutadiene, 2-Methylnaphthalene, 2-Chloronaphthalene, 4-Nitrophenol, Dibenzofuran, 4-Chlorophenyl-phenylether, Hexachlorobenzene, 3,3'-Dichlorobenzidine, 1,1-Biphenyl, Benzaldehyde,	UJ	LCS/LCSD %R < 60%
		Phenol, 4-Nitrophenol	UJ	MS/MSD %R < 45%
MW-006	Monitoring Well	Caprolactum	R	ICAL RF ≤ 0.05
		Acetophenone	U	Rinsate contamination
		Di-n-butylphthalate bis(2-Ethylhexyl)phthalate	U	Method blank and rinsate contamination
		Phenol, bis(2-Chloroethyl)ether, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,2-Dichlorobenzene, Hexachloroethane, Nitrobenzene, 1,2,4-Trichlorobenzene,	UJ	LCS/LCSD %R < 60%

Table 2 (Continued)
SUMMARY OF DATA QUALIFICATION—
SEMIVOLATILE ORGANIC COMPOUNDS

SAMPLE ID	SAMPLE TYPE	ANALYTE	QUALIFIER	RATIONAL
		Naphthalene, 4-Chloroaniline, Hexachlorobutadiene, 2-Methylnaphthalene, 2-Chloronaphthalene, 4-Nitrophenol, Dibenzofuran, 4-Chlorophenyl-phenylether, Hexachlorobenzene, 3,3'-Dichlorobenzidine, 1,1-Biphenyl, Benzaldehyde,		
		Phenol, 4-Nitrophenol	UJ	MS/MSD %R < 45%
MC-002	Microwell	Caprolactum	R	ICAL RF ≤ 0.05
		Phenanthrene, Acetophenone	U	Rinsate contamination
		Di-n-butylphthalate bis(2-Ethylhexyl)phthalate	U	Method blank and rinsate contamination
		Phenol, bis(2-Chloroethyl)ether, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,2-Dichlorobenzene, Hexachloroethane, Nitrobenzene, 1,2,4-Trichlorobenzene, Naphthalene, 4-Chloroaniline, Hexachlorobutadiene, 2-Methylnaphthalene, 2-Chloronaphthalene, 4-Nitrophenol, Dibenzofuran, 4-Chlorophenyl-phenylether, Hexachlorobenzene, 3,3'-Dichlorobenzidine, 1,1-Biphenyl, Benzaldehyde,	UJ	LCS/LCSD %R < 60%
		Phenol, 4-Nitrophenol	UJ	MS/MSD %R < 45%
MC-302	Microwell	Caprolactum	R	ICAL RF ≤ 0.05
		Naphthalene, 2-Methylnaphthalene, Acetophenone	U	Rinsate contamination
		Di-n-butylphthalate bis(2-Ethylhexyl)phthalate	U	Method blank and rinsate contamination
		Phenol, bis(2-Chloroethyl)ether, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,2-Dichlorobenzene,	UJ	LCS/LCSD %R < 60%

Table 2 (Continued)
SUMMARY OF DATA QUALIFICATION—
SEMIVOLATILE ORGANIC COMPOUNDS

SAMPLE ID	SAMPLE TYPE	ANALYTE	QUALIFIER	RATIONAL
		Hexachloroethane, Nitrobenzene, 1,2,4-Trichlorobenzene, Naphthalene, 4-Chloroaniline, Hexachlorobutadiene, 2-Methylnaphthalene, 2-Chloronaphthalene, 4-Nitrophenol, Dibenzofuran, 4-Chlorophenyl-phenylether, Hexachlorobenzene, 3,3'-Dichlorobenzidine, 1,1-Biphenyl, Benzaldehyde,		
		Phenol, 4-Nitrophenol	UJ	MS/MSD %R < 45%
MC-602	Rinsate Blank	Caprolactum	R	ICAL RF ≤ 0.05
		Phenol, bis(2-Chloroethyl)ether, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,2-Dichlorobenzene, Hexachloroethane, Nitrobenzene, 1,2,4-Trichlorobenzene, Naphthalene, 4-Chloroaniline, Hexachlorobutadiene, 2-Methylnaphthalene, 2-Chloronaphthalene, 4-Nitrophenol, Dibenzofuran, 4-Chlorophenyl-phenylether, Hexachlorobenzene, 3,3'-Dichlorobenzidine, 1,1-Biphenyl, Benzaldehyde,	J/UJ	LCS/LCSD %R < 60%
MC-003	Microwell	Caprolactum	R	Caprolactum
		Phenanthrene	U	Poor spectra
		Naphthalene, Diethylphthalate, Acetophenone	U	Rinsate contamination
		Di-n-butylphthalate bis(2-Ethylhexyl)phthalate	U	Method blank and rinsate contamination
		Phenol, bis(2-Chloroethyl)ether, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,2-Dichlorobenzene,	J/UJ	LCS/LCSD %R < 60%

Table 2 (Continued)
SUMMARY OF DATA QUALIFICATION—
SEMIVOLATILE ORGANIC COMPOUNDS

SAMPLE ID	SAMPLE TYPE	ANALYTE	QUALIFIER	RATIONAL
		Hexachloroethane, Nitrobenzene, 1,2,4-Trichlorobenzene, Naphthalene, 4-Chloroaniline, Hexachlorobutadiene, 2-Methylnaphthalene, 2-Chloronaphthalene, 4-Nitrophenol, Dibenzofuran, 4-Chlorophenyl-phenylether, Hexachlorobenzene, 3,3'-Dichlorobenzidine, 1,1-Biphenyl, Benzaldehyde,		
		Phenol, 4-Nitrophenol	UJ	MS/MSD %R < 45%
MW-002	Monitoring Well	Caprolactum	R	ICAL RF ≤ 0.05
		Aetophenone	U	Rinsate contamination
		Di-n-butylphthalate bis(2-Ethylhexyl)phthalate	U	Method blank and rinsate contamination
		Phenol, bis(2-Chloroethyl)ether, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,2-Dichlorobenzene, Hexachloroethane, Nitrobenzene, 1,2,4-Trichlorobenzene, Naphthalene, 4-Chloroaniline, Hexachlorobutadiene, 2-Methylnaphthalene, 2-Chloronaphthalene, 4-Nitrophenol, Dibenzofuran, 4-Chlorophenyl-phenylether, Hexachlorobenzene, 3,3'-Dichlorobenzidine, 1,1-Biphenyl, Benzaldehyde,	UJ	LCS/LCSD %R < 60%
		Phenol, 4-Nitrophenol	UJ	MS/MSD %R < 45%
SS-001-12	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		bis(2-Ethylhexyl)phthalate	U	Rinsate contamination
		Di-n-butylphthalate	U	Method blank and rinsate contamination

Table 2 (Continued)
SUMMARY OF DATA QUALIFICATION—
SEMIVOLATILE ORGANIC COMPOUNDS

SAMPLE ID	SAMPLE TYPE	ANALYTE	QUALIFIER	RATIONAL
SS-005-01	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		bis(2-Ethylhexyl)phthalate	U	Rinsate contamination
		Di-n-butylphthalate	U	Method blank and rinsate contamination
SS-026-04	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		4-Nitrophenol, Pentachlorophenol	UJ	MS/MSD %R < 45%
SS-026-05	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Naphthalene, bis(2-Ethylhexyl)phthalate	U	Rinsate contamination
		Di-n-butylphthalate	U	Method blank and rinsate contamination
SS-026-07	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		bis(2-Ethylhexyl)phthalate	U	Rinsate contamination
		Di-n-butylphthalate	U	Method blank and rinsate contamination
SS-027-04	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Di-n-butylphthalate	U	Method blank and rinsate contamination
SS-027-13	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Di-n-butylphthalate	U	Method blank and rinsate contamination
SS-327-04	Duplicate of SS-027-04	Caprolactum	R	ICAL RF ≤ 0.05
		Naphthalene, Dimethylphthalate, bis(2-Ethylhexyl)phthalate	U	Rinsate contamination
		Di-n-butylphthalate	U	Method blank and rinsate contamination
SS-028-05	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Fluoranthene	U	Poor spectra
		bis(2-Ethylhexyl)phthalate	U	Rinsate contamination
		Di-n-butylphthalate	U	Method blank and rinsate contamination
SS-028-11	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Chrysene	U	Poor spectra
SS-033-04	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Anthracene	U	Poor spectra
		Naphthalene, bis(2-Ethylhexyl)phthalate, Acetophenone	U	Rinsate contamination
		Di-n-butylphthalate	U	Method blank and rinsate contamination
US-001	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Phenanthrene	U	Poor spectra
		Naphthalene, Dimethylphthalate, Diethylphthalate, bis(2-Ethylhexyl)phthalate	U	Rinsate contamination

Table 2 (Continued)
SUMMARY OF DATA QUALIFICATION—
SEMIVOLATILE ORGANIC COMPOUNDS

SAMPLE ID	SAMPLE TYPE	ANALYTE	QUALIFIER	RATIONAL
		Di-n-butylphthalate,	U	Method blank and rinsate contamination
US-002	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		2-Methylnaphthalene	U	Poor spectra
		Diethylphthalate, bis(2-Ethylhexyl)phthalate	U	Rinsate contamination
		Di-n-butylphthalate, Butylbezylphthalate	U	Method blank and rinsate contamination
US-003	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		2-Methylnaphthalene	U	Poor spectra
		Diethylphthalate, bis(2-Ethylhexyl)phthalate	U	Rinsate contamination
		Di-n-butylphthalate, Butylbezylphthalate	U	Method blank and rinsate contamination
		4-Nitrophenol, Pentachlorophenol	UJ	MS/MSD %R < 45%
US-004	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Chrysene	U	Poor spectra
		Naphthalene, Diethylphthalate, bis(2-Ethylhexyl)phthalate	U	Rinsate contamination
		Di-n-butylphthalate, Butylbezylphthalate	U	Method blank and rinsate contamination
US-005	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Naphthalene, Diethylphthalate, bis(2-Ethylhexyl)phthalate	U	Rinsate contamination
		Di-n-butylphthalate, Butylbezylphthalate	U	Method blank and rinsate contamination
US-304	Duplicate of US-004	Caprolactum	R	ICAL RF ≤ 0.05
		Phenanthrene	U	Poor spectra
		Naphthalene, Diethylphthalate, bis(2-Ethylhexyl)phthalate	U	Rinsate contamination
		Di-n-butylphthalate, Butylbezylphthalate	U	Method blank and rinsate contamination
DC-001	Concrete	Caprolactum	R	ICAL RF ≤ 0.05
		Phenanthrene	U	Poor spectra
		All detected acid-phenol compounds	J	Surrogate %Rs below 10%
		All non-detect acid-phenol compounds	R	Surrogate %Rs below 10%
		bis(2-Ethylhexyl)phthalate	U	Rinsate contamination
		Di-n-butylphthalate	U	Method blank and rinsate contamination
DC-301	Duplicate of DC-001	Caprolactum	R	ICAL RF ≤ 0.05
		All acid-phenol compounds	J	Surrogate %Rs below 10%
		All non-detect acid-phenol compounds	R	Surrogate %Rs below 10%
		bis(2-Ethylhexyl)phthalate	U	Rinsate contamination
		Di-n-butylphthalate, Butylbenzylphthalate	U	Method blank and rinsate contamination

Table 2 (Continued)
SUMMARY OF DATA QUALIFICATION—
SEMIVOLATILE ORGANIC COMPOUNDS

SAMPLE ID	SAMPLE TYPE	ANALYTE	QUALIFIER	RATIONAL
SD-001	Sediment	Caprolactum	R	ICAL RF ≤ 0.05
		Benzaldehyde	R	CCAL RF ≤ 0.05
		2-Chloronaphthalene, Fluorene	U	Poor spectra
		Naphthalene	U	Rinsate contamination
		Di-n-butylphthalate, bis(2-Ethylhexyl)phthalate	U	Method blank and rinsate contamination
SD-301	Duplicate of SD-001	Caprolactum	R	ICAL RF ≤ 0.05
		Benzaldehyde	R	CCAL RF ≤ 0.05
		Naphthalene, Dimethylphthalate	U	Rinsate contamination
		Di-n-butylphthalate, bis(2-Ethylhexyl)phthalate	U	Method blank and rinsate contamination
SS-022-01	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Benzaldehyde	R	CCAL RF ≤ 0.05
		Naphthalene	U	Rinsate contamination
SS-023-01	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Benzaldehyde	R	CCAL RF ≤ 0.05
		Naphthalene	U	Rinsate contamination
SS-323-01	Duplicate of SS-023-01	Caprolactum	R	ICAL RF ≤ 0.05
		Benzaldehyde	R	CCAL RF ≤ 0.05
		Naphthalene	U	Rinsate contamination
		Di-n-butylphthalate, bis(2-Ethylhexyl)phthalate	U	Method blank and rinsate contamination
SS-024-01	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Benzaldehyde	R	CCAL RF ≤ 0.05
		Naphthalene	U	Rinsate contamination
		Di-n-butylphthalate, bis(2-Ethylhexyl)phthalate	U	Method blank and rinsate contamination
SS-025-01	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Naphthalene	U	Rinsate contamination
		bis(2-Ethylhexyl)phthalate	U	Method blank and rinsate contamination
SS-029-05	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Benzaldehyde	R	CCAL RF ≤ 0.05
		Di-n-butylphthalate, bis(2-Ethylhexyl)phthalate	U	Method bank and rinsate contamination
SS-029-10	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Benzaldehyde	R	CCAL RF ≤ 0.05
		Anthracene	U	Poor spectra
		Naphthalene	U	Rinsate contamination
		Di-n-butylphthalate, Butylbenzylphthalate	U	Method blank and rinsate contamination

Table 2 (Continued)
SUMMARY OF DATA QUALIFICATION—
SEMIVOLATILE ORGANIC COMPOUNDS

SAMPLE ID	SAMPLE TYPE	ANALYTE	QUALIFIER	RATIONAL
SS-033-01	Soil	Caprolactum	R	ICAL RF ≤ 0.05
		Benzaldehyde	R	CCAL RF ≤ 0.05
		Di-n-butylphthalate, bis(2-Ethylhexyl)phthalate	U	Method blank and rinsate contamination
PD-001	Oil	All non-detect analytes	R	Surrogate %Rs < 10%
		All detected analytes	J	Surrogate %Rs < 10%
		Naphthalene, 2-Methylnaphthalene	D	Result reported from secondary dilution
PD-002	Oil		None	
PD-301	Duplicate of PD-001	All non-detect analytes	R	Surrogate %Rs < 10%
		All detected analytes	J	Surrogate %Rs < 10%
MW-003	Groundwater		None	
MW-004	Groundwater		None	
MW-303	Duplicate of MW-003		None	

5.1 SAMPLE RECEIPT AND HOLDING TIMES

All samples were received at the laboratory intact and under proper COC documentation. Samples were properly preserved and analyzed within the required holding times with the following exception:

- One of the coolers associated with SDG number 100867 (the sample IDs were not identified on the coolers receipt form) was received at the laboratory at a temperature of 6.5°C, which is outside the project-specific temperature range of 4°C $\pm$ 2°C. Because the project-specific temperature range was not grossly exceeded, and EPA National Functional Guidelines do not require data qualification, the sample results were not qualified.

5.2 INSTRUMENT PERFORMANCE CHECK AND CALIBRATIONS

Instrument performance evaluation (i.e., instrument response, peak resolution and column breakdown) analyses prior to the ICALs were not reported by the laboratory. However, instrument performance evaluations were performed at the beginning of each 12-hour period during which pesticide samples were analyzed, per project-specific requirements. Instrument performance evaluation is not required for PCB analyses. The %D between the true and calculated amounts were within project-specific requirements of $\pm$ 25 percent. The 4,4'-DDT and endrin breakdown was within the project-specific requirement of $\leq$ 15 percent.

ICALs were performed according to project-specific requirements. The %RSDs for the target compounds were $\leq$ 20 percent.

CCALs were performed once daily, after every 10 samples, and at the end of the analytical sequence according to project-specific requirements. The average %Ds were $\leq$ 15 percent.

5.3 BLANK REVIEW

Method Blank. The laboratory extracted/analyzed one method blank for each analytical batch, per project specifications. Target analytes were not detected in any of the method blanks.

Equipment Rinsate Blank. One equipment rinsate blank was collected for each twenty samples/matrix, per project-specific requirements. Target analytes were not detected in any of the equipment rinsate blanks.

5.4 SURROGATE RECOVERIES/INTERNAL STANDARDS

All surrogate recoveries met project-specific %R criteria of 40–140 percent (pesticides) and 50–130 percent (PCBs), with the following exceptions.

Soil sample SS-022-01, oil samples PD-002 and PD-302, and groundwater sample MW-303 exhibited low surrogate %Rs. All analytes in these samples were qualified as estimated (J/UJ), as summarized in Table 3.

Internal standard RTs were within the established RT window.

5.5 LABORATORY CONTROL SAMPLES

One LCS/LCSD analysis was performed per 20 samples, as required by project-specific requirements. LCS/LCSD %Rs were within the project-specific criteria of 50–130 percent.

5.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATES

One MS/MSD analysis was performed per 20 samples, as required by project-specific requirements. MS/MSD results were within the project-specific recovery criteria of 40–140 percent and the RPD criteria of $\leq$ 50 percent with two exceptions.

- The MS/MSD analysis of SS-028-11 exhibited high %R for 4,4'-DDT, indicating a potential high bias. The parent sample exhibited a non-detect result for 4,4'-DDT, therefore results were not qualified on the basis of MS/MSD nonconformance.
- The MS/MSD analysis of SD-001 exhibited low %R of Aroclor 1260, indicating a potential low bias. The parent and associated sample (SD-001 and SD-301) were not qualified on the basis of MS/MSD results because the LCS/LCSD results were within criteria.

5.7 CLEANUP CHECKS

Alumina and sulfur cleanups were performed on some sample extracts prior to analysis. Florisil, gel permeation chromatography, and acid cleanups were not performed on the sample extracts. No significant matrix interference was noted in the chromatograms reviewed.

5.8 TARGET COMPOUND IDENTIFICATION AND QUANTITATION

Target compound identification and quantitation was evaluated for 10 percent of the samples. All target compound identifications and quantitations reviewed were acceptable. RRT were within the RT window and were confirmed on a second column.

The RPD between dual-columns was within the project-specific criteria of $\leq$ 40 percent, with three exceptions: 4,4'-DDT for sample SS-028-05, 4,4'-DDE for sample SS-033-04, and endosulfan II for sample PD-001. Results exhibiting RPDs above the criteria between dual-columns were qualified as estimated (J), as summarized in Table 3. Per the QAPP, the higher of the two results was reported.

Three samples were reanalyzed at a secondary dilution and the results (i.e., sediment sample SD-001 and field duplicate SD-301 for Aroclor 1242, and soil sample SS-033-01 for Aroclor 1254) were transcribed to the initial analysis and qualified "D" (result determined from secondary), as summarized in Table 3.

Table 3
SUMMARY OF DATA QUALIFICATION—
PESTICIDES AND POLYCHLORINATED BIPHENYLS

Sample ID	Sample Type	Analyte	Qualifier	Rational
SS-009-08	Soil		None	
SS-009-11	Soil		None	
SS-010-08	Soil		None	
SS-310-08	Soil		None	
SS-010-12	Soil		None	
SS-011-08	Soil		None	
SS-011-11	Soil		None	
SS-012-08	Soil		None	
SS-012-11	Soil		None	
SS-312-11	Duplicate of SS-012-11		None	
SS-013-10	Soil		None	
SS-013-12	Soil		None	
SS-014-04	Soil		None	
SS-015-05	Soil		None	
SS-016-05	Soil		None	
SS-001-01	Soil		None	
SS-003-01	Soil		None	
SS-003-05	Soil		None	
SS-030-10	Soil		None	
SS-031-10	Soil		None	
SS-032-01	Soil		None	
SS-032-14	Soil		None	
SS-002-01	Soil		None	
SS-008-01	Soil		None	
SS-008-05	Soil		None	
SS-608-01	Water Rinsate Blank		None	
SS-007-01	Soil		None	
SS-007-05	Soil		None	
SS-006-01	Soil		None	
SS-006-05	Soil		None	
SS-004-03	Soil		None	
SS-004-09	Soil		None	
SS-031-10	Soil		None	
SS-032-01	Soil		None	
SS-032-14	Soil		None	
SS-002-01	Soil		None	
SS-008-01	Soil		None	
SS-008-05	Soil		None	
SS-608-01	Water Rinsate Blank		None	
SS-007-01	Soil		None	
SS-007-05	Soil		None	
SS-006-01	Soil		None	
SS-006-05	Soil		None	

Table 3 (Continued)
SUMMARY OF DATA QUALIFICATION—
PESTICIDES AND POLYCHLORINATED BIPHENYLS

Sample ID	Sample Type	Analyte	Qualifier	Rational
SS-004-03	Soil		None	
SS-004-09	Soil		None	
MW-001	Monitoring Well		None	
SS-628-11	Rinsate Blank		None	
US-603	Rinsate Blank		None	
MC-001	Microwell		None	
MC-004	Microwell		None	
MC-005	Microwell		None	
MW-005	Monitoring Well		None	
MW-006	Monitoring Well		None	
MC-002	Microwell		None	
MC-302	Microwell		None	
MC-602	Rinsate Blank		None	
MC-003	Microwell		None	
MW-002	Monitoring Well		None	
SS-001-12	Soil		None	
SS-005-01	Soil		None	
SS-026-04	Soil		None	
SS-026-05	Soil		None	
SS-026-07	Soil		None	
SS-027-04	Soil		None	
SS-027-13	Soil		None	
SS-327-04	Duplicate of SS-027-04		None	
SS-028-05	Soil	4,4'-DDT	J	RPD > 40% between columns
SS-028-11	Soil		None	
SS-033-04	Soil	4,4'-DDE	J	RPD > 40% between columns
US-001	Soil		None	
US-002	Soil		None	
US-003	Soil		None	
US-004	Soil		None	
US-005	Soil		None	
US-304	Duplicate of US-004		None	
DC-001	Concrete		None	
DC-301	Duplicate of DC-001		None	
SD-001	Sediment	Aroclor 1242	D	Result reported from secondary dilution
SD-301	Duplicate of SD-001	Aroclor 1242	D	Result reported from secondary dilution
SS-022-01	Soil	All analytes	UJ	Surrogate %R < 40%
SS-023-01	Soil		None	
SS-323-01	Duplicate of SS-023-01		None	
SS-024-01	Soil		None	
SS-025-01	Soil		None	

Table 3 (Continued)
SUMMARY OF DATA QUALIFICATION—
PESTICIDES AND POLYCHLORINATED BIPHENYLS

Sample ID	Sample Type	Analyte	Qualifier	Rational
SS-029-05	Soil		None	
SS-029-10	Soil		None	
SS-033-01	Soil	Aroclor 1254	D	Result reported from secondary dilution
PD-001	Oil	Endosulfan II	J	RPD > 40% between columns
PD-002	Oil	All analytes	UJ	Surrogate %R < 40%
PD-301	Duplicate of PD-001	All analytes	UJ	Surrogate %R < 40%
MW-003	Groundwater		None	
MW-004	Groundwater		None	
MW-303	Duplicate of MW-003	All analytes	UJ	Surrogate %R < 40%
The following samples were analyzed for PCBs only.				
SS-017-01	Soil		None	
SS-018-01	Soil		None	
SS-019-01	Soil		None	
SS-020-01	Soil		None	
SS-319-01	Soil		None	

6.1 SAMPLE RECEIPT AND HOLDING TIMES

All samples were received at the laboratory intact and under proper COC documentation. Samples were properly preserved and analyzed within the required holding times with the following exception:

- One of the coolers associated with SDG number 100867 (the sample IDs were not identified on the coolers receipt form) was received at the laboratory at a temperature of 6.5°C, which is outside the project-specific temperature range of 4°C $\pm$ 2°C. Because the project-specific temperature range was not grossly exceeded, and EPA National Functional Guidelines do not require data qualification, the sample results were not qualified.

6.2 INITIAL AND CONTINUING CALIBRATIONS

ICALs were performed according to project-specific requirements. The coefficient of determination was within project-specific criteria of > 0.990.

CCALs were performed daily before sample analytes, after every 10 samples, and at the end of the analytical sequence, according to project-specific requirements. The %Ds were not summarized by the laboratory; therefore, %Ds were manually verified. The calculated %Ds were within the project-specific criteria of $\leq$ 15 percent.

6.3 BLANK REVIEW

Method Blank. The laboratory extracted/analyzed one method blank for each analytical batch, per project-specific requirements. No target analytes were detected in the method blanks.

Equipment Rinsate Blank. One equipment rinsate blank was collected for each twenty samples/matrix, per project-specific requirements. No target analytes were detected in the equipment rinsate blanks.

6.4 SURROGATE RECOVERIES

All surrogate recoveries met project-specific %R criteria of 50–155 percent, with one exception: surrogates were not recovered in the analysis of sample SS-033-01 due to a 100-fold dilution. The results were not qualified.

6.5 LABORATORY CONTROL SAMPLES

One LCS/LCSD analysis was performed per 20 samples, as required by project-specific requirements. LCS/LCSD %Rs were within the project-specific criteria of 60-140 percent.

6.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATES

One MS/MSD analysis was performed per 20 samples, as required by project-specific requirements. MS/MSD project-specific recovery criteria is 50–180 percent and is $\leq$ 22 percent for RPD. The following MS/MSD analysis exhibited results outside the criteria.

- The MS/MSD for sediment sample SD-001 exhibited a %R below the criteria for diesel, while motor oil exhibited 0% recovery. The parent sample diesel concentration was slightly higher than the spike amount, while the motor oil parent sample concentration was almost five times the spike concentration. The sample results were not qualified based on MS/MSD results.

6.7 TARGET COMPOUND IDENTIFICATION AND QUANTITATION

Target compound identification and quantitation was evaluated for 10 percent of the samples. Target compound identification and quantitation was acceptable.

Table 4
**SUMMARY OF DATA QUALIFICATION—
TOTAL PETROLEUM HYDROCARBON—DIESEL- AND MOTOR OIL-RANGE ORGANICS**

SAMPLE ID	SAMPLE TYPE	ANALYTE	QUALIFIER	RATIONAL
SS-021-04	Soil		None	
SS-321-04	Duplicate of SS-021-04		None	
US-603	Rinsate Blank		None	
SS-026-05	Soil		None	
SS-028-05	Soil		None	
SS-028-11	Soil		None	
SD-001	Sediment		None	
SD-301	Duplicate of SD-001		None	
SS-033-01	Soil		None	

7.1 SAMPLE RECEIPT AND HOLDING TIMES

All samples were received at the laboratory intact and under proper COC documentation. Samples were properly preserved and analyzed within the required holding times with the following exception:

- One of the coolers associated with SDG number 100867 (the sample IDs were not identified on the coolers receipt form) was received at the laboratory at a temperature of 6.5°C, which is outside the project-specific temperature range of 4°C $\pm$ 2°C. Because the project-specific temperature range was not grossly exceeded, and EPA National Functional Guidelines do not require data qualification, the sample results were not qualified.

7.2 INSTRUMENT CALIBRATIONS

Inductively coupled plasma (ICP) ICALs were performed according to project-specific requirements (i.e., one standard and blank, and a low-level check standard at the MRL). The ICP calibrations were within project-specific criteria of ± 20 percent (i.e., 80-120 percent) recovery of the true value for low level check standards and ± 10 percent (i.e., 90-110 percent) recovery for initial calibration verifications (ICVs) and CCALs.

ICALs for mercury were within project-specific criteria of correlation coefficient $\geq$ 0.995, and ICV and CCALs were within the project-specific criteria of ± 10 percent recovery of the true value with the following exceptions:

- One CCV exhibited low recovery (i.e., <90 percent) for mercury (Hg). The associated samples (MC-003 and MW-002) were qualified as estimated (UJ) for total mercury, as referenced in Table 5.
- Two CCALs exhibited low recovery (i.e., < 90 percent) for Hg. The associated samples (i.e., MC-001, MC-004, MC-005, MW-005, MC-002, MC-302, MC-003, MW-006, and MW-002) were qualified as estimated (UJ) for dissolved Hg, as referenced in Table 5.

7.3 INTERELEMENT CHECK STANDARDS

Interelement check standards were analyzed at the beginning of each analytical sequence according to project-specific requirements. The %Rs were within the project-specific criteria of ± 20 percent recovery of the true value.

7.4 BLANK REVIEW

Initial calibration blank (ICB), continuing calibration blank (CCB), and method (preparation) blanks were analyzed in accordance with project-specific requirements. Several QC blanks exhibited metals contamination (i.e., ICB –for potassium (K) and sodium (Na); method blank for antimony (Sb), copper (Cu), nickel (Ni), zinc (Zn), and lead (Pb); CCB for thallium (Tl), selenium (Se) and Na). Samples were not qualified on the basis of the ICB contamination because no samples were analyzed immediately after the ICB. Sample concentrations less than five times the CCB concentrations or ten times the method blank concentrations were qualified non-detect (U) at the appropriate quantitation level, as summarized in Table 5.

Equipment Rinsate Blank. One equipment rinsate blank was collected for each twenty samples/matrix, per project-specific requirements. Equipment rinsate blanks exhibited contamination for several metals (i.e., Sb, chromium (Cr), iron (Fe), manganese (Mn), and Zn). Sample concentrations less than five times the rinsate blank concentration were qualified non-detect (U) at the appropriate quantitation level, as summarized in Table 5.

7.5 ICP SERIAL DILUTIONS

ICP serial dilutions were analyzed for each twenty samples/matrix. The project-specific criteria between diluted and undiluted results is < 10 percent D for samples exhibiting concentrations > 50 times the instrument detection limit (IDL). Serial dilution results for the following samples exhibited %Ds outside QC limits: SS-008-05 for calcium (Ca), cobalt (Co), magnesium (Mg), and strontium (Sr); SS-608-01 for Cr; DC-001 for arsenic As; MW-001 for Ca, K, and silver (Ag); SS-028-11 for Ca and Na; and SD-001 for As, Ca, and Mg. Sample results associated with serial dilution non-conformance were qualified as estimated (J), as summarized in Table 5.

7.6 LABORATORY CONTROL SAMPLES

One LCS/LCSD analysis was performed per 20 samples, as required by project-specific requirements. LCS/LCSD %Rs were within the project-specific criteria of 80–120 percent.

7.7 MATRIX SPIKES

One MS analysis was performed per 20 samples/matrix as required by project-specific requirements. MS project-specific recovery criteria is 75–125 percent, or 80–120 percent for mercury.

Pre-Digestion Spike. Percent recovery for the MS analysis of soil sample SS-009-08 exhibited high %R for aluminum (Al); percent recovery for the MS analysis of soil samples SS-010-12 and SS-028-11 exhibited low recovery for Hg; percent recovery for the MS analysis of SD-001 exhibited low recovery for Ca, Fe and Pb; and the MS analysis of sample MW-001 exhibited low percent recovery for dissolved Na. All analyte results for samples associated with MS %Rs outside the criteria were qualified as estimated (J/UJ). Qualifications resulting from MS non-conformance are referenced in Table 5.

Post-Digestion Spikes. Post-digestion spike %Rs were within project-specific criteria of 75–125 percent with one exception, sample SD-001 exhibited %Rs for Ca, Fe, and Pb below the QC limits. USEPA National Functional Guidelines does not require data qualification for post-digestion spike outliers.

7.8 MATRIX DUPLICATES

One matrix duplicate was analyzed according to project-specific requirements of one per every 20 samples/matrix. Matrix duplicate results were within project-specific criteria of $\leq$ 25 percent RPD, or $\leq$ 20 percent for mercury for values > 5 times the contract required detection limits (CRDLs), or difference < ± CRDL for values < 5 times the CRDL with the following exceptions. The duplicate analysis of sample SS-028-11 for Cu, and analysis of SS-008-05 for Hg exhibited

RPDs above project-specific criteria. All associated samples were qualified as estimated (J/UJ) for Cu and Hg.

Table 5
SUMMARY OF DATA QUALIFICATION—METALS

SAMPLE ID	SAMPLE TYPE	ANALYTE	QUALIFIER	RATIONAL
SS-009-08	Soil	Aluminum	J	MS %R > 125%
		Mercury	J	MS %R < 80%
		Chromium	U	Rinsate blank contamination
SS-009-11	Soil	Aluminum	J	MS %R > 125%
		Mercury	J	MS %R < 80%
		Chromium	U	Rinsate blank contamination
SS-010-08	Soil	Aluminum	J	MS %R > 125%
		Mercury	UJ	MS %R < 80%
		Chromium	U	Rinsate blank contamination
SS-310-08	Soil	Aluminum	J	MS %R > 125%
		Mercury	J	MS %R < 80%
		Chromium	U	Rinsate blank contamination
SS-010-12	Soil	Aluminum	J	MS %R > 125%
		Mercury	UJ	MS %R < 80%
		Chromium	U	Rinsate blank contamination
SS-011-08	Soil	Aluminum	J	MS %R > 125%
		Mercury	J	MS %R < 80%
		Chromium	U	Rinsate blank contamination
SS-011-11	Soil	Aluminum	J	MS %R > 125%
		Mercury	J	MS %R < 80%
		Chromium	U	Rinsate blank contamination
SS-012-08	Soil	Aluminum	J	MS %R > 125%
		Mercury	UJ	MS %R < 80%
		Chromium	U	Rinsate blank contamination
SS-012-11	Soil	Aluminum	J	MS %R > 125%
		Mercury	J	MS %R < 80%
		Chromium	U	Rinsate blank contamination
SS-312-11	Duplicate of SS-012-11	Aluminum	J	MS %R > 125%
		Mercury	UJ	MS %R < 80%
		Chromium	U	Rinsate blank contamination
SS-013-10	Soil	Aluminum	J	MS %R > 125%
		Mercury	UJ	MS %R < 80%
		Chromium	U	Rinsate blank contamination
SS-013-12	Soil	Aluminum	J	MS %R > 125%
		Mercury	UJ	MS %R < 80%
SS-014-04	Soil	Aluminum	J	MS %R > 125%
		Mercury	J	MS %R < 80%
		Chromium	U	Rinsate blank contamination
SS-015-05	Soil	Aluminum	J	MS %R > 125%
		Mercury	J	MS %R < 80%
		Chromium	U	Rinsate blank contamination
SS-016-05	Soil	Aluminum	J	MS %R > 125%
		Mercury	UJ	MS %R < 80%
		Chromium	U	Rinsate blank contamination

Table 5 (Continued)
SUMMARY OF DATA QUALIFICATION—METALS

SAMPLE ID	SAMPLE TYPE	ANALYTE	QUALIFIER	RATIONAL
SS-001-01	Soil	Aluminum	J	MS %R > 125%
		Mercury	J	MS %R < 80%
		Calcium, cobalt, magnesium, strontium	J	ICP serial dilution results > 10% D
		Chromium	U	Rinsate blank contamination
SS-003-01	Soil	Aluminum	J	MS %R > 125%
		Mercury	J	MS %R < 80%
		Calcium, cobalt, magnesium, strontium	J	ICP serial dilution results > 10% D
SS-003-05	Soil	Aluminum	J	MS %R > 125%
		Mercury	J	MS %R < 80%
		Calcium, cobalt, magnesium, strontium	J	ICP serial dilution results > 10% D
SS-030-10	Soil	Aluminum	J	MS %R > 125%
		Mercury	J	MS %R < 80%
		Calcium, cobalt, magnesium, strontium	J	ICP serial dilution results > 10% D
SS-031-10	Soil	Aluminum	J	MS %R > 125%
		Mercury	J	MS %R < 80%
		Calcium, cobalt, magnesium, strontium	J	ICP serial dilution results > 10% D
		Chromium	U	Rinsate blank contamination
SS-032-01	Soil	Iron	J	MS %R < 75%
		Mercury	J	MS %R < 80%
		Calcium, cobalt, magnesium, strontium	J	ICP serial dilution results > 10% D
		Chromium	U	Rinsate blank contamination
SS-032-14	Soil	Iron	J	MS %R < 75%
		Mercury	UJ	MS %R < 80%
		Calcium, cobalt, magnesium, strontium	J	ICP serial dilution results > 10% D
		Chromium	U	Rinsate blank contamination
SS-002-01	Soil	Iron	J	MS %R < 75%
		Mercury	UJ	MS %R < 80%
		Calcium, cobalt, magnesium, strontium	J	ICP serial dilution results > 10% D
		Potassium	U	Rinsate blank contamination
SS-008-01	Soil	Iron	J	MS %R < 75%
		Mercury	J	MS %R < 80%
		Calcium, cobalt, magnesium, strontium	J	ICP serial dilution results > 10% D
		Potassium, chromium	U	Rinsate blank contamination
SS-008-05	Soil	Iron	J	MS %R < 75%
		Mercury	J	MS %R < 80%
		Calcium, cobalt, magnesium, strontium	J	ICP serial dilution results > 10% D
SS-608-01	Water Rinsate Blank		None	
SS-007-01	Soil	Iron	J	MS %R < 75%
		Mercury	J	Duplicate RPD > 25%
		Calcium, cobalt, magnesium, strontium	J	ICP serial dilution results > 10% D
SS-007-05	Soil	Iron	J	MS %R < 75%
		Mercury	J	Duplicate RPD > 25%
		Calcium, cobalt, magnesium, strontium	J	ICP serial dilution results > 10% D
SS-006-01	Soil	Iron	J	MS %R < 75%
		Mercury	J	Duplicate RPD > 25%
		Calcium, cobalt, magnesium, strontium	J	ICP serial dilution results > 10% D

Table 5 (Continued)
SUMMARY OF DATA QUALIFICATION—METALS

SAMPLE ID	SAMPLE TYPE	ANALYTE	QUALIFIER	RATIONAL
SS-006-05	Soil	Iron	J	MS %R < 75%
		Mercury	J	Duplicate RPD > 25%
		Calcium, cobalt, magnesium, strontium	J	ICP serial dilution results > 10% D
SS-004-03	Soil	Iron	J	MS %R < 75%
		Mercury	J	Duplicate RPD > 25%
		Calcium, cobalt, magnesium, strontium	J	ICP serial dilution results > 10% D
SS-004-09	Soil	Iron	J	MS %R < 75%
		Mercury	J	Duplicate RPD > 25%
		Calcium, cobalt, magnesium, strontium	J	ICP serial dilution results > 10% D
		Chromium	U	Rinsate blank contamination
MW-001 (Total)	Monitoring Well	Antimony	U	Preparation Blank Contamination
		Calcium, potassium	J	ICP serial dilution results > 10% D
		Iron, chromium, zinc, manganese	U	Rinsate blank contamination
MW-001 (Dissolved)	Monitoring Well	Antimony, copper, nickel, zinc	U	Preparation Blank Contamination
		Sodium	J	MS %R < 75%
SS-628-11	Rinsate Blank		None	
US-603	Rinsate Blank		None	
MC-001 (Total)	Microwell	Antimony	U	Preparation Blank Contamination
		Thallium	U	Continuing calibration blank contamination
		Chromium, zinc	U	Rinsate blank contamination
MC-001 (Dissolved)	Microwell	Mercury	UJ	Continuing calibration %R < 90%
		Antimony, lead	U	Preparation Blank Contamination
		Sodium	J	MS %R < 75%
MC-004 (Total)	Microwell	Antimony	U	Preparation Blank Contamination
		Thallium	U	Continuing calibration blank contamination
		Chromium, zinc	U	Rinsate blank contamination
MC-004 (Dissolved)	Microwell	Mercury	UJ	Continuing calibration %R < 90%
		Antimony, lead, zinc	U	Preparation Blank Contamination
		Selenium	U	Continuing calibration blank contamination
		Sodium	J	MS %R < 75%
MC-005 (Total)	Microwell	Antimony	U	Preparation Blank Contamination
		Thallium	U	Continuing calibration blank contamination
		Chromium, zinc	U	Rinsate blank contamination
MC-005 (Dissolved)	Microwell	Mercury	UJ	Continuing calibration %R < 90%
		Antimony, lead	U	Preparation Blank Contamination
		Selenium	U	Continuing calibration blank contamination
		Sodium	J	MS %R < 75%
MW-005 (Total)	Monitoring Well	Antimony	U	Preparation Blank Contamination
		Thallium	U	Continuing calibration blank contamination
		Chromium, zinc	U	Rinsate blank contamination
MW-005 (Dissolved)	Monitoring Well	Mercury	UJ	Continuing calibration %R < 90%
		Antimony, copper, zinc	U	Preparation Blank Contamination
		Sodium	J	MS %R < 75%

Table 5 (Continued)
SUMMARY OF DATA QUALIFICATION—METALS

SAMPLE ID	SAMPLE TYPE	ANALYTE	QUALIFIER	RATIONAL
MW-006 (Total)	Monitoring Well	Antimony	U	Preparation Blank Contamination
		Thallium	U	Continuing calibration blank contamination
		Chromium, zinc	U	Rinsate blank contamination
MW-006 (Dissolved)	Monitoring Well	Mercury	UJ	Continuing calibration %R < 90%
		Antimony, lead, nickel, zinc	U	Preparation Blank Contamination
		Selenium	U	Continuing calibration blank contamination
		Sodium	J	MS %R < 75%
MC-002 (Total)	Microwell	Antimony	U	Preparation Blank Contamination
		Thallium	U	Continuing calibration blank contamination
		Chromium, zinc	U	Rinsate blank contamination
MC-002 (Dissolved)	Microwell	Mercury	UJ	Continuing calibration %R < 90%
		Antimony, lead, nickel, zinc	U	Preparation Blank Contamination
		Selenium	U	Continuing calibration blank contamination
		Sodium	J	MS %R < 75%
MC-302 (Total)	Microwell	Antimony	U	Preparation Blank Contamination
		Thallium	U	Continuing calibration blank contamination
		Chromium,zinc	U	Rinsate blank contamination
MC-302 (Dissolved)	Microwell	Mercury	UJ	Continuing calibration %R < 90%
		Antimony, lead, nickel, zinc	U	Preparation Blank Contamination
		Selenium	U	Continuing calibration blank contamination
		Sodium	J	MS %R < 75%
MC-602	Rinsate Blank		None	
MC-003 (Total)	Microwell	Mercury	UJ	ICV %R < 90%
		Antimony	U	Preparation Blank Contamination
		Calcium, chromium, zinc	U	Rinsate blank contamination
MC-003 (Dissolved)	Microwell	Mercury	UJ	Continuing calibration %R < 90%
		Antimony, lead, zinc	U	Preparation Blank Contamination
		Sodium	J	MS %R < 75%
MW-002 (Total)	Monitoring Well	Mercury	UJ	ICV %R < 90
		Antimony	U	Preparation Blank Contamination
		Iron, chromium, lead, manganese, zinc	U	Rinsate blank contamination
MW-002 (Dissolved)	Monitoring Well	Mercury	UJ	Continuing calibration %R < 90%
		Antimony, copper, nickel, zinc	U	Preparation Blank Contamination
		Sodium	J	MS %R < 75%
SS-001-12	Soil	Mercury	UJ	MS %R < 80%
		Copper	J	Duplicate RPD > 25%
		Calcium, sodium	J	ICP serial dilution results > 10% D
		Chromium	U	Rinsate blank contamination
SS-005-01	Soil	Mercury	J	MS %R < 80%
		Copper	J	Duplicate RPD > 25%
		Calcium, sodium	J	ICP serial dilution results > 10% D

Table 5 (Continued)
SUMMARY OF DATA QUALIFICATION—METALS

SAMPLE ID	SAMPLE TYPE	ANALYTE	QUALIFIER	RATIONAL
SS-026-04	Soil	Mercury	J	MS %R < 80%
		Copper	J	Duplicate RPD > 25%
		Calcium, sodium	J	ICP serial dilution results > 10% D
SS-026-05	Soil	Mercury	J	MS %R < 80%
		Copper	J	Duplicate RPD > 25%
		Calcium, sodium	J	ICP serial dilution results > 10% D
SS-026-07	Soil	Mercury	UJ	MS %R < 80%
		Copper	J	Duplicate RPD > 25%
		Calcium, sodium	J	ICP serial dilution results > 10% D
		Chromium	U	Rinsate blank contamination
SS-027-04	Soil	Mercury	J	MS %R < 80%
		Copper	J	Duplicate RPD > 25%
		Calcium, sodium	J	ICP serial dilution results > 10% D
SS-027-13	Soil	Mercury	UJ	MS %R < 80%
		Copper	J	Duplicate RPD > 25%
		Calcium, sodium	J	ICP serial dilution results > 10% D
		Antimony, chromium	U	Rinsate blank contamination
SS-327-04	Duplicate of SS-027-04	Mercury	J	MS %R < 80%
		Copper	J	Duplicate RPD > 25%
		Calcium, sodium	J	ICP serial dilution results > 10% D
SS-028-05	Soil	Mercury	J	MS %R < 80%
		Copper	J	Duplicate RPD > 25%
		Calcium	J	ICP serial dilution results > 10% D
SS-028-11	Soil	Mercury	J	MS %R < 80%
		Calcium, sodium	J	ICP serial dilution results > 10% D
		Copper	J	Duplicate RPD > 25%
SS-033-04	Soil	Arsenic	J	ICP serial dilution results > 10% D
US-001	Soil	Sodium	U	Continuing calibration blank contamination
		Arsenic	J	ICP serial dilution results > 10% D
		Chromium, lead	U	Rinsate blank contamination
US-002	Soil	Arsenic	J	ICP serial dilution results > 10% D
		Chromium, lead	U	Rinsate blank contamination
US-003	Soil	Sodium	U	Continuing calibration blank contamination
		Arsenic	J	ICP serial dilution results > 10% D
		Chromium, lead	U	Rinsate blank contamination
US-004	Soil	Arsenic	J	ICP serial dilution results > 10% D
		Chromium, lead	U	Rinsate blank contamination
US-005	Soil	Sodium	U	Continuing calibration blank contamination
		Arsenic	J	ICP serial dilution results > 10% D
		Chromium, lead	U	Rinsate blank contamination
US-304	Duplicate of US-004	Arsenic	J	ICP serial dilution results > 10% D
		Chromium, lead	U	Rinsate blank contamination
DC-001	Concrete	Arsenic	J	ICP serial dilution results > 10% D

Table 5 (Continued)
SUMMARY OF DATA QUALIFICATION—METALS

SAMPLE ID	SAMPLE TYPE	ANALYTE	QUALIFIER	RATIONAL
DC-301	Duplicate of DC-001	Sodium	U	Continuing calibration blank contamination
		Arsenic	J	ICP serial dilution results > 10% D
SD-001	Sediment	Sodium	U	Continuing calibration blank contamination
		Calcium, iron, lead	J	MS %R < 75%
		Calcium, arsenic, magnesium	J	ICP serial dilution results > 10% D
SD-301	Duplicate of SD-001	Sodium	U	Continuing calibration blank contamination
		Calcium, iron, lead	J	MS %R < 75%
		Calcium, arsenic, magnesium	J	ICP serial dilution results > 10% D
SS-022-01	Soil	Sodium	U	Continuing calibration blank contamination
		Calcium, arsenic, magnesium	J	ICP serial dilution results > 10% D
SS-023-01	Soil	Sodium	U	Continuing calibration blank contamination
		Calcium, arsenic, magnesium	J	ICP serial dilution results > 10% D
SS-323-01	Duplicate of SS-023-01	Sodium	U	Continuing calibration blank contamination
		Calcium, arsenic, magnesium	J	ICP serial dilution results > 10% D
SS-024-01	Soil	Sodium	U	Continuing calibration blank contamination
		Calcium, arsenic, magnesium	J	ICP serial dilution results > 10% D
SS-025-01	Soil	Sodium	U	Continuing calibration blank contamination
		Calcium, arsenic, magnesium	J	ICP serial dilution results > 10% D
SS-029-05	Soil	Sodium	U	Continuing calibration blank contamination
		Calcium, arsenic, magnesium	J	ICP serial dilution results > 10% D
SS-029-10	Soil	Calcium, magnesium	J	ICP serial dilution results > 10% D
		Chromium	U	Rinsate blank contamination
SS-033-01	Soil	Calcium, arsenic, magnesium	J	ICP serial dilution results > 10% D
PD-001	Oil		None	
PD-002	Oil		None	
PD-301	Duplicate of PD-001		None	
MW-003	Groundwater		None	
MW-004	Groundwater		None	
MW-303	Duplicate of MW-003		None	
The following sample was analyzed for TCLP Metals				
SS-033-01	Soil		None	

8.1 SAMPLE RECEIPT AND HOLDING TIMES

All samples were received at the laboratory intact and under proper COC documentation. Samples were properly preserved and analyzed within the required holding times with the following exception:

- One of the coolers associated with SDG number 100867 (the sample IDs were not identified on the coolers receipt form) was received at the laboratory at a temperature of 6.5°C, which is outside the project-specific temperature range of 4°C ± 2°C. Because the project-specific temperature range was not grossly exceeded, and EPA National Functional Guidelines do not require data qualification, the sample results were not qualified.

8.2 INSTRUMENT CALIBRATIONS

ICALs were performed according to project-specific requirements. The %RSDs for the target compounds were within project-specific specification of $\leq$ 20 percent.

CCALs were performed daily before sample analysis, after every 10 samples, and at the end of the analytical sequence according to project-specific requirements. The %Ds were within the project-specific criteria of $\leq$ 15 percent.

8.3 BLANK REVIEW

Method Blank. The laboratory extracted/analyzed one method blank for each analytical batch, per project-specific requirements. No target analytes were detected in the method blanks.

Equipment Rinsate Blank. One equipment rinsate blank was collected per twenty samples/matrix, per project-specific requirements. No target analytes were detected in the equipment rinsate blanks.

8.4 SURROGATE RECOVERIES

All surrogate recoveries met project-specific criteria of 50–150 percent.

8.5 LABORATORY CONTROL SAMPLES

One LCS/LCSD analysis was performed per 20 samples/matrix, as required by project-specific requirements. LCS/LCSD %Rs were within the project-specific criteria of 60–120 percent.

8.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATES

One MS/MSD analysis was performed per 20 samples, as required by project-specific requirements. The MS/MSDs were within project-specific criteria of 50–140 percent recovery and $\leq$ 50 percent RPD.

8.7 TARGET COMPOUND IDENTIFICATION AND QUANTITATION

Target compounds were not detected in any of the samples. Ten percent of the chromatograms and quantitation reports were reviewed. No false negatives were identified.

Table 6
SUMMARY OF DATA QUALIFICATION—
NITROAMINE AND NITROAROMATIC COMPOUNDS

SAMPLE ID	SAMPLE TYPE	ANALYTE	QUALIFIER	RATIONAL
US-603	Equipment Rinsate Blank		None	
US-001	Soil		None	
US-002	Soil		None	
US-003	Soil		None	
US-004	Soil		None	
US-005	Soil		None	
US-304	Duplicate of US-004		None	

9.1 SAMPLE RECEIPT AND HOLDING TIMES

All samples were received at the laboratory intact and under proper COC documentation. Samples were properly preserved and analyzed within the required holding times with the following exception:

- One of the coolers associated with SDG number 100867 (the sample IDs were not identified on the coolers receipt form) was received at the laboratory at a temperature of 6.5°C, which is outside the project-specific temperature range of 4°C ± 2°C. Because the project-specific temperature range was not grossly exceeded, and EPA National Functional Guidelines do not require data qualification, the sample results were not qualified.

9.2 INSTRUMENT CALIBRATIONS

ICALs were performed according to project-specific requirements. All standard concentrations were within the project-specific criteria of 10%D of their known concentrations and the ICALs exhibited correlation coefficients > 0.990.

ICVs and CCALs were performed according to project-specific requirements. All %Rs were within the project-specific criteria of 10 percent of their known concentration.

9.3 BLANK REVIEW

Calibration and Method Blanks. Calibration and method blanks were analyzed at the project-specific frequency and were non-detect for cyanide.

Equipment Rinsate Blank. One equipment rinsate blank was collected per twenty samples/matrix, per project-specific requirements. Cyanide was not detected in the rinsate blanks.

9.4 LABORATORY DUPLICATES

Laboratory duplicates were analyzed at the required frequency of one per 20 samples/matrix, per project-specific requirements. The duplicates were within the project-specific criteria of ≤ 20% RPD.

9.5 LABORATORY CONTROL SAMPLES

One LCS analysis was performed at the required frequency of one per 20 samples/matrix. LCS %R was within project-specific %R criteria of 80–120 percent.

9.6 MATRIX SPIKE

One MS analysis was performed per 20 samples/matrix, as required by project-specific requirements. MS recovery was within the project-specific %R criteria of 75–125 percent with two exceptions. The matrix spike %Rs for samples MW-001, SD-001, and PD-001 were below the criteria, but above 30 percent Associated sample results were qualified as estimated (UJ), as summarized in Table 7.

Table 7
SUMMARY OF DATA QUALIFICATION—CYANIDE

SAMPLE ID	SAMPLE TYPE	ANALYTE	QUALIFIER	RATIONAL
SS-009-08	Soil		None	
SS-009-11	Soil		None	
SS-010-08	Soil		None	
SS-310-08	Soil		None	
SS-010-12	Soil		None	
SS-011-08	Soil		None	
SS-011-11	Soil		None	
SS-012-08	Soil		None	
SS-012-11	Soil		None	
SS-312-11	Duplicate of SS-012-11		None	
SS-013-10	Soil		None	
SS-013-12	Soil		None	
SS-014-04	Soil		None	
SS-015-05	Soil		None	
SS-016-05	Soil		None	
SS-001-01	Soil		None	
SS-003-01	Soil		None	
SS-003-05	Soil		None	
SS-030-10	Soil		None	
SS-031-10	Soil		None	
SS-032-01	Soil		None	
SS-032-14	Soil		None	
SS-002-01	Soil		None	
SS-008-01	Soil		None	
SS-008-05	Soil		None	
SS-608-01	Rinsate Blank		None	
SS-007-01	Soil		None	
SS-007-05	Soil		None	
SS-006-01	Soil		None	
SS-006-05	Soil		None	
SS-004-03	Soil		None	
SS-004-09	Soil		None	
MW-001	Monitoring Well	Cyanide	UJ	MS %R < 75%
SS-623-01	Rinsate Blank		None	
SS-628-11	Rinsate Blank		None	
MC-001	Microwell	Cyanide	UJ	MS %R < 75%
MC-004	Microwell	Cyanide	UJ	MS %R < 75%
MC-005	Microwell	Cyanide	UJ	MS %R < 75%
MW-005	Monitoring Well	Cyanide	UJ	MS %R < 75%
MW-006	Monitoring Well	Cyanide	UJ	MS %R < 75%
MC-002	Microwell	Cyanide	UJ	MS %R < 75%
MC-302	Microwell	Cyanide	UJ	MS %R < 75%
MC-602	Microwell	Cyanide	UJ	MS %R < 75%
MC-003	Microwell	Cyanide	UJ	MS %R < 75%
MW-002	Monitoring Well	Cyanide	UJ	MS %R < 75%
SS-001-12	Soil		None	

Table 7 (Continued)
SUMMARY OF DATA QUALIFICATION—CYANIDE

SAMPLE ID	SAMPLE TYPE	ANALYTE	QUALIFIER	RATIONAL
SS-005-01	Soil		None	
SS-026-04	Soil		None	
SS-026-05	Soil		None	
SS-026-07	Soil		None	
SS-027-04	Soil		None	
SS-027-13	Soil		None	
SS-327-04	Soil		None	
SS-028-05	Soil		None	
SS-028-11	Soil		None	
SS-033-04	Soil		None	
DC-001	Concrete		None	
DC-301	Concrete		None	
SD-001	Sediment	Cyanide	UJ	MS %R < 75%
SD-301	Sediment	Cyanide	UJ	MS %R < 75%
SS-022-01	Soil		None	
SS-023-01	Soil		None	
SS-323-01	Soil		None	
SS-024-01	Soil		None	
SS-025-01	Soil		None	
SS-029-05	Soil		None	
SS-029-10	Soil		None	
SS-033-01	Soil		None	
PD-001	Oil	Cyanide	UJ	MS %R < 75%
PD-002	Oil	Cyanide	UJ	MS %R < 75%
PD-301	Duplicate of PD-001	Cyanide	J	MS %R < 75%
MW-003	Groundwater		None	
MW-004	Groundwater		None	
MW-303	Duplicate of MW-003		None	

The chemical agent breakdown product analyses were performed in accordance with laboratory standard operating procedures (SOPs). The laboratory would not release the SOPs for review prior to sample analysis. The data were reviewed following common USEPA and USACE analytical techniques (e.g., GC/MS, GC, HPLC, etc.) and validated using professional judgment.

10.1 SAMPLE RECEIPT AND HOLDING TIMES

All samples were received at the laboratory intact and under proper COC documentation. Samples were properly preserved and analyzed within the required holding time.

10.2 INSTRUMENT PERFORMANCE CHECK AND CALIBRATIONS

Instrument performance checks (i.e., DFTPPs) were performed at the beginning of each 12-hour period during which samples or standards are analyzed for Vx-thiol compounds, per project-specific requirements. Ion abundance criteria were within QC limits.

ICALs were performed according to project-specific requirements for oxathiane and dithiane; Vx-thiol compounds; methylphosphonic acid (MPA); isopropyl methylphosphonic acid (IMPA); and thiodiglycol. The RRFs for the Vx-thiol compounds were $\geq$0.05 and the r^2s were >0.99.

The ICAL %RSDs were within project-specific criteria of $\leq$20 percent (oxathiane and dithiane) or $\leq$30 percent (Vx-thiol compounds). The thiodiglycol ICAL %R was outside the criteria of 15%. In both cases, the calculated concentrations were above the theoretical concentrations, indicating potential high bias. The associated sample results were non-detect; therefore, the results were not qualified.

CCALs were performed according to project-specific requirements. The RFs for the Vx-thiol target compounds were within the project-specific criteria of $\geq$ 0.05 for Vx-thiol compounds. The %Ds were within the project-specific criteria of $\leq$ 15 percent (thiodiglycol), $\leq$ 25 percent (oxathiane and dithiane) and $\leq$20 percent (Vx-thiol compounds). The %Rs were within the project specific criteria of 25-140 percent for MPA/IMPA.

10.3 BLANK REVIEW

Method Blank. The laboratory analyzed one method blank for each analytical batch, per project-specific requirements. Target compounds were not detected in the method blank.

Equipment Rinsate Blank. One equipment rinsate blank was collected per twenty samples/matrix, per project-specific requirements. Target compounds were not detected in the equipment rinsate blank.

10.4 INTERNAL STANDARDS (OXATHIANE, DITHIANE AND VX-THIOLS)

Internal standard RTs were within $\pm$ 0.05 RT units of the daily CCAL for oxathiene and dithiane, and internal standard responses were between –50 percent to +100 percent of the daily CCAL for Vx-thiol compounds.

10.5 LABORATORY CONTROL SAMPLES

One LCS/LCSD analysis was performed per 20 samples, as required by project-specific requirements. LCS/LCSD %Rs were within the project-specific criteria of 50–150 percent (oxathiane and dithiane), 30-160 percent (Vx-thiol compounds), 25–140 percent (MPA/IMPA), and 60-120 percent (for all other target analytes).

10.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATES

One MS/MSD analysis was performed per 20 samples, as required by project-specific requirements. MS/MSD %Rs were within the project-specific criteria of 40–140 percent (oxathiane and dithiane), 30–160 percent (MS) and 45–135 percent (MSD) (Vx-thiol compounds), 25-140 percent (MPA/IMPA) and 50-140 percent (for all other analytes), and the RPD criteria of <60 percent (Vx-thiol compounds) and <50 percent (for all other compounds).

10.7 TARGET COMPOUND IDENTIFICATION AND QUANTITATION

Target compounds were not detected in the samples. Ten percent of the spectra (Vx-thiol compounds), chromatograms, and quantitation reports were reviewed. No false negatives were identified.

Table 8
SUMMARY OF DATA QUALIFICATION—
AGENT BREAKDOWN PRODUCTS

SAMPLE ID	SAMPLE TYPE	ANALYTE	QUALIFIER	RATIONAL
US-001	Soil		None	
US-002	Soil		None	
US-003	Soil		None	
US-004	Soil		None	
US-005	Soil		None	
US-304	Field Duplicate		None	
US-603	Equipment Rinsate Blank		None	

11.1 SAMPLE RECEIPT AND HOLDING TIMES

All samples were received at the laboratory intact and under proper COC documentation. Samples were properly preserved and analyzed within the required holding times.

11.2 INSTRUMENT CALIBRATIONS

ICALs were performed according to project-specific requirements. All standard concentrations were within the project-specific criteria of 10%D of their known concentrations and the ICALs exhibited correlation coefficients > 0.990.

ICVs and CCALs were performed according to project-specific requirements. All %Rs were within the project-specific criteria of 10% of their known concentration.

11.3 BLANK REVIEW

Method blanks were analyzed at the project-specific frequency and were non-detect for cyanide and sulfide.

11.4 LABORATORY DUPLICATES

Laboratory duplicates were analyzed at the required frequency of one per 20 samples/matrix, per project-specific requirements. The duplicates were within the project-specific criteria of $\leq$ 20 percent RPD.

11.5 LABORATORY CONTROL SAMPLES

One LCS analysis was performed at the required frequency of one per 20 samples/matrix. LCS %Rs were below the project-specific %R criteria of 80–120 percent for the reactive cyanide analysis. Associated samples were qualified as estimated (UJ), as summarized in Table 9.

11.6 MATRIX SPIKE

One MS analysis was performed per 20 samples/matrix, as required by project-specific requirements. MS recovery was below the project-specific %R criteria of 75–125 percent for both the reactive cyanide and reactive sulfide analyses. Associated sample results were qualified as estimated (UJ), as summarized in Table 9.

Table 9
SUMMARY OF DATA QUALIFICATION—
REACTIVE CYANIDE AND REACTIVE SULFIDE

SAMPLE ID	SAMPLE TYPE	ANALYTE	QUALIFIER	RATIONAL
PD-001	Oil	Reactive Cyanide	UJ	LCS %R < 80% and MS %R < 75%
		Reactive Sulfide	UJ	MS %R < 75%
PD-002	Oil	Reactive Cyanide	UJ	LCS %R < 80% and MS %R < 75%
		Reactive Sulfide	UJ	MS %R < 75%
PD-302	Duplicate of PD-001	Reactive Cyanide	UJ	LCS %R < 80% and MS %R < 75%
		Reactive Sulfide	UJ	MS %R < 75%

12.1 SAMPLE RECEIPT AND HOLDING TIMES

All samples were received at the laboratory intact and under proper COC documentation. The method recommends that the corrosivity analysis be conducted as soon after collection as possible. The method does not specify a recommended hold time for the ignitability analysis. Samples were collected on January 8, 2002, and analyzed nine days later for corrosivity and thirteen days later for ignitability. No data were qualified based on sample holding times.

12.2 LABORATORY DUPLICATES

One laboratory duplicate was analyzed for corrosivity. The duplicate result was within 0.01 pH units. No data were qualified based on laboratory duplicate results, as shown in Table 10.

Table 10
SUMMARY OF DATA QUALIFICATION—
IGNITABILITY AND CORROSIVITY

SAMPLE ID	SAMPLE TYPE	ANALYTE	QUALIFIER	RATIONAL
PD-001	Oil		None	
PD-002	Oil		None	
PD-301	Duplicate of PD-001		None	

A total of 11 field duplicates (1 product, 1 concrete, 1 sediment, 6 soil and 2 water) was collected during the sample events covered by this review. The RPD is not calculated when the sample results are less than five times the reporting limits. Field duplicate precision is summarized in Tables 11 (solids) and 12 (aqueous) for results greater than five times the reporting limits. The field duplicate project-specific control limit is 30 percent for aqueous samples and 50 percent for solid samples. Primary and duplicate samples exhibiting an RPD above the control limit are highlighted. The field duplicate results show generally good agreement with the exception of high concentrations of PAHs in solids. Data were not qualified based on field duplicate RPD.

Table 11
SUMMARY OF FIELD DUPLICATE PRECISION—SOLIDS

ANALYTE	PRIMARY SAMPLE		FIELD DUPLICATE		RPD
VOCs - µg/Kg	**DC-001**		**DC-301**		
2-Butanone	12.1	J	11.1	J	8.6
Acetone	41.8	J	52	J	21.7
m,p-Xylene	1.06	U	17.5		177.2
o-Xylene	0.412	U	7.43		179.0
	SD-001		**SD-301**		
2-Butanone	28.6	J	13.7	J	70.4
Acetone	126	J	59.7	J	71.4
Benzene	1.27		1.01		22.8
Carbon Tetrachloride	43.8	D	9.33	D	129.8
Carbon disulfide	13.3	J	7.21	J	59.4
Methylcyclohexane	1.37		1.05		26.4
	SS-023-01		**SS-323-01**		
2-Butanone	14.4	J	19.4	J	29.6
Acetone	121	J	168	J	32.5
Benzene	1.86		3.17		52.1
	SS-027-04		**SS-327-04**		
2-Butanone	12.6	J	14	J	10.5
Acetone	136	J	124	J	9.2
Carbon disulfide	1.2	J	3.09	J	88.1
Trichlorofluoromethane	8.49		0.261	U	188.1
	PD-002		**PD-302**		
ethylbenzene	188,000		135,000		32.8
m,p-xylene	692,000		436,000		45.4
o-xylene	244,000		181,000		29.6
SVOCs - µg/Kg	DC-001		DC-301		
Fluoranthene	9.88		5.61		55.1
	SD-001		**SD-301**		
Acenaphthylene	53.3		56.2		5.3
Benzo(a)anthracene	171		169		1.2
Benzo(a)pyrene	276		203		30.5
Benzo(b)fluoranthene	169		2.08	U	195.1
Benzo(g,h,i)perylene	161		74.9		73.0
Benzo(k)fluoranthene	60.2		2.08	U	186.6
Chrysene	145		196		29.9

Table 11 (Continued)
SUMMARY OF FIELD DUPLICATE PRECISION—SOLIDS

ANALYTE	PRIMARY SAMPLE	FIELD DUPLICATE	RPD
Fluoranthene	186	135	31.8
Phenanthrene	72.3	37	64.6
Pyrene	241	195	21.1
	SS-021-04	**SS-321-04**	
2-Methylnaphthalene	144	146	1.4
Acenaphthene	266	292	9.3
Acenaphthylene	28.2	36.4	25.4
Anthracene	712	888	22.0
Benzo(a)anthracene	1220	1470	18.6
Benzo(a)pyrene	1260	1960	43.5
Benzo(b)fluoranthene	830	1120	29.7
Benzo(g,h,i)perylene	398	675	51.6
Benzo(k)fluoranthene	358	668	60.4
Chrysene	1460	1900	26.2
Fluoranthene	1560	1840	16.5
Fluorene	294	321	8.8
Indeno(1,2,3-cd)pyrene	253	261	3.1
Phenanthrene	2800	3410	19.6
Pyrene	3060	3690	18.7
	SS-023-01	**SS-323-01**	
Acenaphthene	289	36.3	155.4
Anthracene	484	76.4	145.5
Benzo(a)anthracene	564	231	83.8
Benzo(a)pyrene	906	283	104.8
Benzo(g,h,i)perylene	14.3 U	152	165.6
Chrysene	500	264	61.8
Fluoranthene	1750	428	121.4
Phenanthrene	1270	218	141.4
Pyrene	1340	387	110.4
	SS-027-04	**SS-327-04**	
Acenaphthene	239	30.1	155.3
Anthracene	317	53	142.7
Benzo(a)anthracene	560	171	106.4
Benzo(a)pyrene	438	147	99.5
Benzo(b)fluoranthene	517	150	110.0
Benzo(g,h,i)perylene	238	76.8	102.4
Benzo(k)fluoranthene	203	100	68.0
bis(2-Ethylhexyl)phthalate	1410 D	31.1 U	191.4
Chrysene	408	146	94.6
Dibenzo(a,h)anthracene	56.9	30.5	60.4
Dibenzofuran	122	18.1	148.3
Fluoranthene	1330 D	355	115.7
Fluorene	205	40.2	134.4
Indeno(1,2,3-cd)pyrene	228	75.4	100.6
Phenanthrene	1050 D	232	127.6

Table 11 (Continued)
SUMMARY OF FIELD DUPLICATE PRECISION—SOLIDS

ANALYTE	PRIMARY SAMPLE		FIELD DUPLICATE		RPD
Pyrene	1000	D	274		114.0
	US-004		**US-304**		
2-Methylnaphthalene	6.1		6.2		1.6
	PD-002		**PD-302**		
2-methylnaphthalene	989		8,170	J	156.8
naphthalene	24,500		83,300	J	109.1
PCBs-mg/Kg	SD-001		SD-301		
Aroclor 1242	6670	D	3920	D	51.9
Aroclor 1260	465		168		93.8
	SS-019-01		**SS-319-01**		
Aroclor 1254	0.056		0.052		7.4
TPH-mg/Kg	SD-001		SD-301		
Diesel Range Hydrocarbons	1090		619		55.1
Motor Oil Range Hydrocarbons	4230		2360		56.8
	SS-021-04		**SS-321-04**		
Diesel Range Hydrocarbons	92.5		92		0.5
Motor Oil Range Hydrocarbons	629		525		18.0
Metals - mg/Kg	DC-001		DC-301		
Aluminum	6290		5140		20.1
Arsenic	21.1	J	20.1	J	4.9
Barium	101		99.1		1.9
Cadmium	0.81		0.99		20.0
Calcium	84800		68100		21.8
Chromium	44.6		35.8		21.9
Cobalt	10.6		11.4		7.3
Copper	32.6		33.5		2.7
Iron	19000		20100		5.6
Lead	6.11		6.75		10.0
Magnesium	4260		4320		1.4
Manganese	360		324		10.5
Nickel	8.32		10.4		22.2
Potassium	948		658		36.1
Silver	0.137		0.163		17.3
Strontium	155		140		10.2
Uranium	0.605		0.666		9.6
Vanadium	46.5		48		3.2
Zinc	184		165		10.9
	SD-001		**SD-301**		
Aluminum	11300		12300		8.5
Arsenic	23.7	J	23.4	J	1.3
Barium	212		206		2.9
Cadmium	2.12		1.85		13.6
Calcium	25100	J	25100	J	0.0
Chromium	101		99.4		1.6
Cobalt	10.5		11.5		9.1

Table 11 (Continued)
SUMMARY OF FIELD DUPLICATE PRECISION—SOLIDS

ANALYTE	PRIMARY SAMPLE		FIELD DUPLICATE		RPD
Copper	272		277		1.8
Iron	31000	J	31100	J	0.3
Lead	273	J	290	J	6.0
Magnesium	13500	J	15700	J	15.1
Manganese	464	J	450		3.1
Mercury	31.3		23.7		27.6
Nickel	96.1		95.6		0.5
Potassium	1960		2540		25.8
Silver	12.8		12.2		4.8
Strontium	95.4		101		5.7
Uranium	0.747		0.66		12.4
Vanadium	51.8		53.7		3.6
Zinc	741		723		2.5
	SS-010-08		**SS-310-08**		
Aluminum	1820	J	1840	J	1.1
Antimony	1.15	J	1.22	J	5.9
Barium	9.3		10.3		10.2
Beryllium	0.406	U	0.403	U	0.7
Cadmium	0.355		0.366		3.1
Calcium	1290		1330		3.1
Cobalt	1.76		1.88		6.6
Copper	27.5		35.8		26.2
Iron	4020		3930		2.3
Lead	0.404		0.43		6.2
Magnesium	271		349		25.2
Manganese	33		32.3		2.1
Nickel	2.26		2.45		8.1
Potassium	95.9	J	101	J	5.2
Silver	0.0495		0.0543		9.2
Sodium	298		242		20.7
Strontium	12.5		13.7		9.2
Uranium	0.122		0.103		16.9
Vanadium	16		13.6		16.2
Zinc	11.8		11.4		3.4
	SS-012-11		**SS-312-11**		
Aluminum	872	J	1120	J	24.9
Barium	4.85		5.71		16.3
Cadmium	0.209		0.207		1.0
Calcium	1020		1200		16.2
Cobalt	0.968		1.32		30.8
Copper	6.57		8.92		30.3
Iron	2210		3380		41.9
Lead	0.336		0.276		19.6
Magnesium	130		253		64.2
Manganese	18.2		25.4		33.0

Table 11 (Continued)
SUMMARY OF FIELD DUPLICATE PRECISION—SOLIDS

ANALYTE	PRIMARY SAMPLE		FIELD DUPLICATE		RPD
Nickel	1.13	J	1.52	J	29.4
Potassium	63.3	J	78	J	20.8
Silver	0.103		0.0375		93.2
Strontium	6.71		8.49		23.4
Uranium	0.0366		0.0483		27.6
Vanadium	8.42		11.9		34.3
Zinc	4.39		5.27		18.2
	SS-023-01		**SS-323-01**		
Aluminum	9690		8640		11.5
Arsenic	2.3	J	1.9	J	19.0
Barium	135		138		2.2
Beryllium	0.154	J	0.194	J	23.0
Cadmium	1.02		0.898		12.7
Calcium	8280	J	8150	J	1.6
Chromium	16.9		18.7		10.1
Cobalt	9.85		10.9		10.1
Copper	30.5		29.7		2.7
Iron	21600		21800		0.9
Lead	45.3		43.6		3.8
Magnesium	3330	J	3460	J	3.8
Manganese	344		406		16.5
Mercury	0.712		0.505		34.0
Nickel	14.7		16.2		9.7
Potassium	793		673		16.4
Silver	0.719		0.662		8.3
Strontium	61.9		58		6.5
Uranium	0.479		0.486		1.5
Vanadium	55.2		55.3		0.2
Zinc	130		120		8.0
	SS-027-04		**SS-327-04**		
Aluminum	8080		7370		9.2
Arsenic	3.14		3		4.6
Barium	48.5		50.9		4.8
Cadmium	0.712		0.763		6.9
Calcium	6080	J	4310	J	34.1
Chromium	11.3		13.6		18.5
Cobalt	7.66		8.51		10.5
Copper	17.1	J	18.9	J	10.0
Iron	17800		19000		6.5
Lead	11.6		15.6		29.4
Magnesium	3030		2920		3.7
Manganese	377		335		11.8
Mercury	3.33	J	4.6	J	32.0
Nickel	8.96		10.4		14.9
Potassium	506		534		5.4

Table 11 (Continued)
SUMMARY OF FIELD DUPLICATE PRECISION—SOLIDS

ANALYTE	PRIMARY SAMPLE		FIELD DUPLICATE		RPD
Silver	0.771		1.53		66.0
Sodium	287	J	383	J	28.7
Strontium	51.1		49.5		3.2
Uranium	0.307		0.358		15.3
Vanadium	48.2		56.2		15.3
Zinc	70.2		76.9		9.1
	US-004		**US-304**		
Aluminum	3660		3430		6.5
Arsenic	1.38	J	1.32	J	4.4
Barium	79		78.6		0.5
Cadmium	0.725		0.746		2.9
Calcium	5430		5640		3.8
Cobalt	8.27		7.86		5.1
Copper	10.4		11.4		9.2
Iron	16400		16100		1.8
Magnesium	3030		2870		5.4
Manganese	353		324		8.6
Nickel	6.51		6.38		2.0
Potassium	1010		879		13.9
Silver	0.123		0.138		11.5
Strontium	42.3		40.9		3.4
Uranium	0.298		0.312		4.6
Vanadium	37.9		35.3		7.1
Zinc	30.5		27.9		8.9
	PD-002		**PD-302**		
Aluminum	12.2	J	8.39	J	37.0
antimony	0.0723	J	0.273	J	116.2
barium	1.47		1.95		28.1
calcium	3390		3530		4.0
chromium	0.725	J	1.08	J	39.3
cobalt	2.8		2.88		2.8
copper	0.665	J	1.24	J	60.4
iron	91.3		85		7.1
lead	10.1		116		168.0
magnesium	140	J	141	J	0.7
manganese	20		22.1		10.0
nickel	0.217	J	0.157	J	32.1
potassium	10300		9510		8.0
silver	0.133	J	0.129	J	3.1
sodium	4970		4690		5.8
strontium	2.98		3.17		6.2
zinc	2.88	J	1.79	J	46.7

Table 12
SUMMARY OF FIELD DUPLICATE PRECISION—AQUEOUS

ANALYTE	PRIMARY SAMPLE		FIELD DUPLICATE		RPD
Total Metals (mg/L)	**MC-002**		**MC-302**		
Aluminum	1.5		0.919		48.0
Barium	0.0108		0.00888		19.5
Beryllium	0.000071	J	0.000067	J	5.8
Cadmium	0.000157	J	0.000116	J	30.0
Calcium	12.1		11.8		2.5
Cobalt	0.000928		0.000771		18.5
Copper	0.0136		0.0127		6.8
Iron	2.87		2.11		30.0
Lead	0.000455	J	0.000403	J	12.1
Magnesium	1.91		1.87		2.1
Manganese	0.0192		0.0166		14.5
Nickel	0.0016		0.00147		8.5
Potassium	4.01		4.11		2.5
Sodium	48.4		50.2		3.7
Strontium	0.0529		0.0494		6.8
Uranium	0.000149		0.000138		7.7
Vanadium	0.0198		0.0161		20.6
Dissolved Metals (mg/L)					
Aluminum	0.0901		0.169		60.9
Arsenic	0.00044	J	0.00051	J	14.7
Barium	0.00519		0.00599		14.3
Calcium	11.9		11.7		1.7
Chromium	0.00101		0.00103		2.0
Cobalt	0.000383	J	0.000438	J	13.4
Copper	0.00473		0.00604		24.3
Iron	0.488		0.654		29.1
Magnesium	1.89		1.84		2.7
Manganese	0.0138		0.0141		2.2
Potassium	4.15		4.11		1.0
Ssodium	51.7	J	51.7	J	0.0
Strontium	0.0444		0.0441		0.7
Vanadium	0.00948		0.0114		18.4
	MW-003		**MW-303**		
Total Metals (mg/L)					
Aluminum	0.197	J	0.184	J	6.8
Antimony	0.000525	J	0.000685	J	26.4
Calcium	10		9.97		0.3
Copper	0.00649	J	0.00659	J	1.5
Iron	0.41		0.384		6.5
Lead	0.000131	J	0.000168	J	24.7

Table 12 (Continued)
SUMMARY OF FIELD DUPLICATE PRECISION—AQUEOUS

ANALYTE	PRIMARY SAMPLE		FIELD DUPLICATE		RPD
Magnesium	1.19		1.22		2.5
Potassium	1.54		1.43		7.4
Sodium	4.01		4.09		2.0
Strontium	0.0911		0.0811		11.6
Vanadium	0.00666		0.00614		8.1
Dissolved Metals (mg/L)					
Aluminum	0.0172	J	0.0201	J	15.5
Antimony	0.00015	J	0.000197	J	27.1
Barium	0.00254	J	0.00263	J	3.5
Calcium	10		10.1		1.0
Copper	0.00419	J	0.00402	J	4.1
Magnesium	1.16		1.15		0.9
Potassium	1.45		1.6		9.8
Sodium	4.1		4.22		2.9
Strontium	0.0672		0.0782		15.1
Zinc	0.0178		0.0182		2.2

Completeness was calculated as follows:

Completeness (%) = V/Px100

Where:

V = Number of valid measurements (not rejected)
P = Number of planned measurements (number of samples x number of analyses x number of analytes)

Completeness for this sampling event is 99 percent based upon receipt of usable results for all compound analyses requested on the COC forms. The project target goal for completeness of 98 percent was attained.

Data Quality Review Report Addendum

SITE INVESTIGATION
FORMER NORTH PACIFIC DIVISION LABORATORY
TROUTDALE, OREGON

Prepared for:
U.S. ARMY CORPS OF ENGINEERS
Seattle District

Prepared by:
URS CORPORATION

April 2003

This Data Quality Review Report addresses samples collected as part of a Site Investigation at the former North Pacific Division Laboratory located in Troutdale, Oregon.

A total of 6 primary water samples, 1 field duplicate, 1 equipment rinsate blank, and 1 trip blank were collected on April 10, 2003. Severn-Trent Laboratories (formerly Sound Analytical Services, Inc.), of Tacoma, Washington conducted all of the analyses. The analytical results are presented in the Site Investigation Report. A summary of data qualification on a per fraction basis is presented in Tables 1 through 8.

The following analyses were conducted.

PARAMETER	METHOD
Target Compound List (TCL) Volatile Organic Compounds (VOCs)	EPA Method 8260B Modified
TCL Semivolatile Organic Compounds (SVOCs)	EPA Method 8270C
TCL Organochlorine Pesticides and PCBs (Pest/PCBs)	EPA Method 8081A/8082
Total Petroleum Hydrocarbons - Diesel Range and Heavy Oil Organics (TPH-Dx)	NWTPH-Dx Modified
Metals (Total and Dissolved)	EPA Method 6010B/6020
Mercury (Total and Dissolved)	EPA Method 7470A/7471A
Total Cyanide	EPA Method 9012A

A quality assurance/quality control (QA/QC) data review was performed on all samples. This review includes the evaluation of the following QA/QC elements: verification of compliance with the QAPP, sample preservation and handling procedures, holding times, initial and continuing calibrations, method reporting limits (MRL), QC results (i.e., surrogates, internal standards, matrix spike/matrix spike duplicates [MS/MSD], laboratory control samples [LCS]), rinsate blank, laboratory blank and trip blank contamination, data completeness, and data qualifiers assigned by the laboratory.

A data validation was performed on 10 percent of the samples. The data validation included all of the elements of the data review, as well as the evaluation of raw data.

The analytical data was validated following the guidelines and procedures outlined in the U.S. Environmental Protection Agency's (EPA's) *Contract Laboratory Program National Functional Guidelines for Organic Data Review* (dated October 1999) and *Inorganic Data Review* (dated February 1994), modified for the methods used and project-specific QA/QC criteria.

3.1 SAMPLE RECEIPT AND HOLDING TIMES

All samples were received at the laboratory intact and under proper chain-of-custody (COC) documentation. Samples were properly preserved and analyzed within the required holding times.

3.2 INSTRUMENT PERFORMANCE CHECK AND CALIBRATIONS

Instrument performance checks (e.g., bromofluorobenzene [BFB]) were performed at the beginning of each 12-hour period during which samples or standards were analyzed per project-specific requirements. The ion abundance criteria were met.

Initial calibrations (ICALs) were performed according to project-specific requirements. Average relative response factors (RRFs) for the target compounds were > 0.05 in all cases.

The percent relative standard deviations (%RSDs) for the target compounds were $\leq$ 30.0 percent for standard linear calibrations or the coefficient of determinations were > 0.990 for least-square regression calibrations.

Continuing calibrations (CCAL) were performed before sample analysis and at the end of analytical sequences according to project-specific requirements, except for bromomethane. Since bromomethane was not detected in any project samples, no qualifiers are assigned. Response factors (RFs) for target compounds were $\geq$ 0.05.

The percent drift or percent differences (%Ds) for the continuing calibration check compounds (CCCs) were $\leq$ 20 percent and the average %Ds for all analytes were $\leq$ 20 percent.

3.3 BLANK REVIEW

Method Blank. The laboratory analyzed one method blank for each 12-hour analytical sequence, per project-specific requirements. No target analytes were detected in the method blank.

Trip Blank. A trip blank was included with the shipment of samples analyzed for VOCs, which met project-specific requirements and no target analytes were detected in the trip blank.

Equipment Rinsate Blank. One equipment rinsate blank was collected for this sampling event. Chloroform, trichloroethene, and 1,4 dichlorobenzene were detected in the rinsate blank. However, none of these compounds were detected in these samples and no qualifiers were applied.

3.4 SURROGATE/INTERNAL STANDARD RECOVERIES

All surrogate compound recoveries met project-specific criteria percent recovery (%R) of 80–120 percent.

Internal Standard (IS) %Rs and retention times (RT) were evaluated for 10 percent of the data. Sample RTs did not vary more than 30 seconds from the associated 12-hour CCAL, nor did recoveries vary more than a factor of two (–50 percent to +100 percent).

3.5 LABORATORY CONTROL SAMPLES

One laboratory control sample/laboratory control sample duplicate (LCS/LCSD) analysis was performed, as required by project-specific requirements. LCS/LCSD project-specific criteria are 80–120 percent for water matrices. Percent recoveries were all within project limits, but the relative percent difference (18%) was outside of the laboratory limits (15%) for chlorobenzene. The QAPP does not have a limit for variability in the LCS/LCSD, but 18% is lower than the QAPP limit for MS/MSDs. No qualifiers are applied.

3.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATES

One matrix spike/matrix spike duplicate (MS/MSD) analysis was performed, as required by project-specific requirements. MS/MSD project-specific recovery criteria for is 70–130 percent. MS/MSD project-specific relative percent difference (RPD) criteria for aqueous matrices is <30 percent. Results for all compounds were within QAPP limits and no qualifiers are necessary.

3.7 TARGET COMPOUND IDENTIFICATION AND QUANTITATION

Target compound identification and quantitation was evaluated for 10 percent of the samples. All target compound identifications and quantitations reviewed were acceptable. Relative retention times (RRT) were within ±0.06 RT units of the daily CCAL. The method reporting limits (MRLs) reported by STL are generally a factor of ~2 above the QAPP specification. No qualifiers are assigned as result of this deviation.

4.1 SAMPLE RECEIPT AND HOLDING TIMES

All samples were received at the laboratory intact and under proper chain-of-custody (COC) documentation. Samples were properly preserved and analyzed within the required holding times.

4.2 INSTRUMENT PERFORMANCE CHECK AND CALIBRATIONS

Instrument performance checks (i.e., decafluorotriphenylphosphine [DFTPP]) were performed at the beginning of each 12-hour period during which samples or standards were analyzed per project-specific requirements and ion-abundances were within specifications.

ICALs were performed according to project-specific requirements. RRFs for the target compounds were ≥ 0.05. The %RSDs for the target compounds were within the project-specific criteria of ≤ 30 percent, with the exception of benzyl alcohol and benzoic acid. Positive results for these analytes qualified as estimated and flagged "J"

CCALs were performed according to project-specific requirements, which is at the beginning of each 12 hour analytical sequence and at the end of the analytical sequence. The RFs for the target compounds were ≥0.05. The average %D for all analytes was ≤ 20 percent for each CCAL; therefore data were not qualified.

4.3 BLANK REVIEW

Method Blank. The laboratory extracted/analyzed a method blank for this analytical batch, per project-specific requirements. Phenol and bis(2-ethylhexyl) phthalate were detected in the method blank. Associated sample results exhibiting concentrations less than ten times the method blank contamination were qualified non-detect (U) at the appropriate quantitation level. Affected samples are summarized in Table 1.

Equipment Rinsate Blank. One equipment rinsate blank was collected per project-specific requirements and contained 1,4-dichlorobenzene, naphthalene, acenaphthalene, and bis(2-ethylhexyl)phthalate.

Associated sample results that exhibited concentrations less than five times the blank contamination concentration (or less than 10 times for phthalate compounds) were qualified as not detected (U) at the appropriate quantitation level. Affected samples are summarized in Table 1.

4.4 SURROGATE/INTERNAL STANDARD RECOVERIES

All surrogate recoveries met project-specific %R criteria of 45–135 percent recovery for base-neutral compounds and 35–140 percent for acid-phenol compounds.

IS %Rs and RTs were evaluated for 10 percent of the data. Evaluated IS responses were within –50 percent to +100 percent of the responses of the associated 12-hour CCAL. IS RTs did not vary by more than ± 30 seconds from the retention time of the associated 12-hour CCAL.

4.5 LABORATORY CONTROL SAMPLES

One LCS/LCSD %R analysis was performed per 20 samples, as required by project-specific requirements. LCS/LCSD project-specific recovery criteria are 60-120 percent, 45-135 percent, and 50-150 percent, depending upon the compound. All LCS/LCSD %Rs were within the criteria.

4.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATES

One MS/MSD analysis was performed per 20 samples, as required by project-specific requirements. MS/MSD project-specific recovery criteria for solid and aqueous matrices is 45–135 percent. MS/MSD project-specific RPD criteria is $\leq$ 50 percent for aqueous matrices and $\leq$ 60 percent for solids. %Rs and RPDs were within the criteria with the following exceptions.

- The RPD for benzoic acid (78%) is outside limits. Since this compound was not-detected in any project samples, no qualifiers are assigned.

4.7 TARGET COMPOUND IDENTIFICATION AND QUANTITATION

Target compound quantitation was evaluated for 10 percent of the samples. No data were qualified on the basis of compound quantitation.

Compound identification was evaluated for 100 percent of the samples. RRTs were within $\pm$ 0.06 RT units of the daily calibration.

Table 1
SUMMARY OF DATA QUALIFICATION—
SEMIVOLATILE ORGANIC COMPOUNDS

SAMPLE ID	SAMPLE TYPE	ANALYTE	QUALIFIER	RATIONAL
MW-003	Water	Bis(2-ethylhexyl)phthalate	U	Method / rinsate blank contamination
MW-303	Water	Bis(2-ethylhexyl)phthalate	U	Method / rinsate blank contamination
MW-005	Water	Bis(2-ethylhexyl)phthalate	U	Method / rinsate blank contamination
MW-006	Water	Bis(2-ethylhexyl)phthalate	U	Method / rinsate blank contamination
		Benzyl alcohol Benzoic acid	J	ICAL RSD > 30%

5.1 SAMPLE RECEIPT AND HOLDING TIMES

All samples were received at the laboratory intact and under proper COC documentation. Samples were properly preserved and analyzed within the required holding times.

5.2 INSTRUMENT PERFORMANCE CHECK AND CALIBRATIONS

Instrument performance evaluation (i.e., instrument response, peak resolution and column breakdown) analyses prior to the ICALS were not reported by the laboratory. However, instrument performance evaluations were performed at the beginning of each 12-hour period during which pesticide samples were analyzed, per project-specific requirements. Instrument performance evaluation is not required for PCB analyses. The %D between the true and calculated amounts were within project-specific requirements of $\pm$ 25 percent. The 4,4'-DDT and endrin breakdown was within the project-specific requirement of $\leq$ 15 percent.

ICALs were performed according to project-specific requirements. The %RSDs for the target compounds were $\leq$ 20 percent.

CCALs were performed once daily, after every 10 samples, and at the end of the analytical sequence according to project-specific requirements. The average %Ds were $\leq$ 15 percent.

5.3 BLANK REVIEW

Method Blank. The laboratory extracted/analyzed one method blank for each analytical batch, per project specifications. Target analytes were not detected in any of the method blanks.

Equipment Rinsate Blank. One equipment rinsate blank was collected for each twenty samples/matrix, per project-specific requirements. Beta-BHC was detected in the rinsate blank and detected concentrations of this chemical within 5 times this result will be qualified as not-detected and flagged with a "U".

5.4 SURROGATE RECOVERIES/INTERNAL STANDARDS

All surrogate recoveries met project-specific %R criteria of 40–140 percent (pesticides) and 50–130 percent (PCBs), with the following exceptions.

Internal standard RTs were within the established RT window.

5.5 LABORATORY CONTROL SAMPLES

One LCS/LCSD analysis was performed per 20 samples, as required by project-specific requirements. LCS/LCSD %Rs were within the project-specific criteria of 50–130 percent.

5.6 MATRIX SPIKE/MATRIX SPIKE DUPLICATES

For pesticides, one MS/MSD analysis was performed per 20 samples, as required by project-specific requirements. A MS/MSD was not performed for PCBs because the laboratory failed to spike these compounds.

MS/MSD results were within the project-specific recovery criteria of 40–140 percent and the RPD criteria of ≤ 50 percent with two exceptions. The RPD for alpha-BHC and heptachlor were >50% due to low recoveries in the MSD. Since all samples were not-detected no qualifiers were assigned.

5.7 TARGET COMPOUND IDENTIFICATION AND QUANTITATION

Target compound identification and quantitation was evaluated for 10 percent of the samples. All target compound identifications and quantitations reviewed were acceptable. RRT were within the RT window and were confirmed on a second column.

The RPD between dual-columns was within the project-specific criteria of ≤ 40 percent, except for beta-BHC in samples MW-303 and MW-006. These results are qualified as not-detected ("U") due to rinsate blank contamination, so no additional qualifiers are assigned.

Table 2
SUMMARY OF DATA QUALIFICATION—
PESTICIDES AND POLYCHLORINATED BIPHENYLS

SAMPLE ID	SAMPLE TYPE	ANALYTE	QUALIFIER	RATIONAL
MW-003	Water	Beta-BHC	U	Rinsate blank contamination
MW-303	Water	Beta-BHC	U	Rinsate blank contamination
MW-006	Water	Beta-BHC	U	Rinsate blank contamination

6.1 SAMPLE RECEIPT AND HOLDING TIMES

All samples were received at the laboratory intact and under proper COC documentation. Samples were properly preserved and analyzed within the required holding times.

6.2 INSTRUMENT CALIBRATIONS

Inductively coupled plasma (ICP) ICALs were performed according to project-specific requirements (i.e., one standard and blank, and a low-level check standard at the MRL). The ICP calibrations were within project-specific criteria of ± 20 percent (i.e., 80-120 percent) recovery of the true value for low level check standards and ± 10 percent (i.e., 90-110 percent) recovery for initial calibration verifications (ICVs) and CCALs.

ICALs for mercury were within project-specific criteria of correlation coefficient $\geq$ 0.995, and ICV and CCALs were within the project-specific criteria of ± 10 percent recovery.

6.3 INTERELEMENT CHECK STANDARDS

Interelement check standards were analyzed at the beginning of each analytical sequence according to project-specific requirements. The %Rs were within the project-specific criteria of ± 20 percent recovery of the true value.

6.4 BLANK REVIEW – TOTAL METALS

Initial calibration blank (ICB), continuing calibration blank (CCB), and method (preparation) blanks were analyzed in accordance with project-specific requirements. The method blank exhibited low level of sodium. Sample concentrations less than ten times the method blank concentrations were qualified non-detect (U) at the appropriate quantitation level, as summarized in Table 3. A factor of ten was used because sodium is a common contaminant in aqueous sample and detection in a method blank indicates a significant potential for false positives.

Equipment Rinsate Blank. One equipment rinsate blank was collected for each twenty samples/matrix, per project-specific requirements. The blank exhibited low-level contamination for several metals (i.e., antimony, barium, calcium, chromium, copper, iron, lead, nickel, thallium, vanadium, zinc). Sample concentrations less than five times the rinsate blank concentration were qualified non-detect (U) at the appropriate quantitation level, as summarized in Table 3.

6.5 BLANK REVIEW – DISSOLVED METALS

Initial calibration blank (ICB), continuing calibration blank (CCB), and method (preparation) blanks were analyzed in accordance with project-specific requirements. The method blank exhibited low level of calcium and magnesium. Sample concentrations less than ten times the method blank concentrations were qualified non-detect (U) at the appropriate quantitation level, as summarized in Table 3. A factor of ten was used because calcium and magnesium are common contaminants in aqueous sample and detection in a method blank indicates a significant potential for false positives.

Equipment Rinsate Blank. One equipment rinsate blank was collected for each twenty samples/matrix, per project-specific requirements. The blank exhibited low-level contamination for several metals (i.e., antimony, calcium, lead, and thallium). Sample concentrations less than five times the rinsate blank concentration were qualified non-detect (U) at the appropriate quantitation level, as summarized in Table 3. As before, a factor of ten was used for calcium.

6.6 ICP SERIAL DILUTIONS

ICP serial dilutions were analyzed for each twenty samples/matrix. The project-specific criteria between diluted and undiluted results is < 10 percent D for samples exhibiting concentrations > 50 times the instrument detection limit (IDL). No results were outside of control limits.

6.7 LABORATORY CONTROL SAMPLES

One LCS/LCSD analysis was performed per 20 samples, as required by project-specific requirements. LCS/LCSD %Rs were within the project-specific criteria of 80–120 percent.

6.8 MATRIX SPIKES

One MS analysis was performed per 20 samples/matrix as required by project-specific requirements. MS project-specific recovery criteria is 75–125 percent, or 80–120 percent for mercury. No results were outside control limits.

6.9 MATRIX DUPLICATES

One matrix duplicate was analyzed according to project-specific requirements of one per every 20 samples/matrix. Matrix duplicate results were within project-specific criteria of $\leq$ 25 percent RPD, or $\leq$ 20 percent for mercury for values > 5 times the contract required detection limits (CRDLs), or difference < $\pm$ CRDL for values < 5 times the CRDL.

Table 3
SUMMARY OF DATA QUALIFICATION—METALS

SAMPLE ID	SAMPLE TYPE	ANALYTE	QUALIFIER	RATIONAL
MW-003	Water	Sodium	U	Method blank contamination
		Antimony Barium Copper Iron Nickel Thallium Vanadium	U	Rinsate blank contamination
MW-303	Water	Sodium	U	Method blank contamination
		Antimony Barium Copper Iron Nickel Thallium Vanadium	U	Rinsate blank contamination
MW-005	Water	Antimony Barium Copper Iron Lead Nickel Thallium Vanadium Zinc	U	Rinsate blank contamination
MW-002	Water	Sodium	U	Method blank contamination
		Antimony Barium Copper Iron Lead Nickel Thallium Vanadium Zinc	U	Rinsate blank contamination
MW-006	Water	Antimony Barium Chromium Copper Iron Nickel Thallium Zinc	U	Rinsate blank contamination
MW-004	Water	Antimony Barium Lead Nickel Thallium Vanadium Zinc	U	Rinsate blank contamination

Table 3 (Continued)
SUMMARY OF DATA QUALIFICATION—METALS

SAMPLE ID	SAMPLE TYPE	ANALYTE	QUALIFIER	RATIONAL
MW-001	Water	Antimony Barium Chromium Iron Lead Zinc	U	Rinsate blank contamination
MW-003	Water (dissolved)	Antimony Thallium	U	Rinsate blank contamination
MW-303	Water (dissolved)	Antimony Thallium	U	Rinsate blank contamination
MW-005	Water (dissolved)	Antimony Lead Mercury Thallium	U	Rinsate blank contamination
MW-002	Water (dissolved)	Antimony Lead Mercury Thallium	U	Rinsate blank contamination
MW-006	Water (dissolved)	Lead Thallium	U	Rinsate blank contamination
MW-004	Water (dissolved)	Antimony Lead Mercury Thallium	U	Rinsate blank contamination
MW-001	Water (dissolved)	Antimony Mercury Thallium	U	Rinsate blank contamination

7.1 SAMPLE RECEIPT AND HOLDING TIMES

All samples were received at the laboratory intact and under proper COC documentation. Samples were properly preserved and analyzed within the required holding times.

7.2 INSTRUMENT CALIBRATIONS

ICALs were performed according to project-specific requirements. All standard concentrations were within the project-specific criteria of 10%D of their known concentrations and the ICALs exhibited correlation coefficients > 0.990.

ICVs and CCALs were performed according to project-specific requirements. All %Rs were within the project-specific criteria of 10 percent of their known concentration.

7.3 BLANK REVIEW

Calibration and Method Blanks. Calibration and method blanks were analyzed at the project-specific frequency and were non-detect for cyanide.

Equipment Rinsate Blank. One equipment rinsate blank was collected per twenty samples/matrix, per project-specific requirements. Cyanide was not detected in the rinsate blanks.

7.4 LABORATORY DUPLICATES

Laboratory duplicates were analyzed at the required frequency of one per 20 samples/matrix, per project-specific requirements. The duplicates were within the project-specific criteria of $\leq$ 20% RPD.

7.5 LABORATORY CONTROL SAMPLES

One LCS analysis was performed at the required frequency of one per 20 samples/matrix. LCS %R was within project-specific %R criteria of 80–120 percent.

7.6 MATRIX SPIKE

One MS analysis was performed per 20 samples/matrix, as required by project-specific requirements. MS recovery was within the project-specific %R criteria of 75–125 percent.

One field duplicate was collected during the sample events covered by this review. The RPD is not calculated when the sample results are less than five times the reporting limits. The only analyte detected at greater than five times the reporting limits was calcium in total and dissolved water and the precision was acceptable.

Table 11
SUMMARY OF FIELD DUPLICATE PRECISION—

ANALYTE	PRIMARY SAMPLE	FIELD DUPLICATE	RPD
Metals (mg/L)	**MW-001**	**MW-303**	
Calcium	8.71	8.28	5.2
Calcium (dissolved)	8.68	8.39	3.5

Completeness was calculated as follows:

Completeness (%) = V/Px100

Where:

V = Number of valid measurements (not rejected)
P = Number of planned measurements (number of samples x number of analyses x number of analytes)

Completeness for this sampling event is 100 percent based upon receipt of usable results for all compound analyses requested on the COC forms. The project target goal for completeness of 98 percent was attained.